

## **Factors Influencing Physical Education Development and Implementation in Massachusetts Title 1 Elementary Schools**

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### **ABSTRACT**

**Purpose:** Quality physical education (PE) supports children's health and physical literacy, but socioeconomic disparities and inconsistent policies contribute to gaps in PE access and quality, especially in Title 1 schools. This study examines policy, systems, and environmental factors influencing PE development and implementation in Title 1 schools. **Methods:** We collected surveys from 16 PE specialists and conducted follow-up interviews with 10 specialists from Massachusetts Title 1 elementary schools to explore district and school PE policies and practices. Using an explanatory sequential mixed-methods design, we identified barriers and facilitators to PE development

and implementation. Survey data were analyzed descriptively, and interviews were thematically analyzed using the Theoretical Domains Framework. **Results:** Specialists reported a strong identity, confidence in their abilities, and support from the PE community despite limited guidance and environmental constraints. PE was perceived as a low priority for leadership, and implementation was hindered by limited control over the teaching environment, unclear student assessments, insufficient professional development, and limited feedback. **Conclusion:** Findings build foundational knowledge and guide strategies to support quality PE in Massachusetts Title 1 schools and beyond.

**Keywords:** Title 1 Schools, Quality PE, PE policy, PE Practices, PE Implementation

## 1. INTRODUCTION

United States (U.S.) public schools, along with staff, families, and communities, play an important role in helping children achieve the recommended 60 minutes of daily moderate-to-vigorous physical activity (MVPA) (Institute of Medicine, 2013; Ridgers et al., 2012; Carlson et al., 2013). School-based opportunities include recess, before- and after-school activities and physical education (PE) programs (Centers for Disease Control and Prevention, 2019; Webster, 2023; Centers for Disease Control and Prevention, 2013). As an academic subject, PE can deliver standards-based curricula that help build the foundational knowledge, physical literacy and motor skills essential for lifelong physical activity (PA) (SHAPE America, 2015; Physical Activity Council, 2017; The Aspen Institute, 2015).

Authoritative bodies recommend strengthening PE programs to expand their role in supporting children's health and wellbeing (Institute of Medicine, 2013; Centers for Disease Control and Prevention, 2019; American Heart Association, 2019; American Public Health Association, 2021). The Society of Health and Physical Educators (SHAPE America) provides research, advocacy and policy guidance to help states and districts develop quality PE programs in the U.S. (The National Association for Sport and Physical Education, 2011; U.S. Department of Health and Human Services, 2018; SHAPE America, 2014). For example, SHAPE America defines the essential components of quality PE as policy and environment, curriculum, instruction and student assessment and offers resources to support their integration and monitoring (SHAPE America, 2015). Creating and delivering evidence-based PE programs, such as those aligned with SHAPE standards, is crucial for

improving the health and wellbeing of school-aged children (Dauenhauer et al., 2019).

Despite the well-documented benefits of quality PE, it remains a low priority in many U.S. K–12 schools. According to the 2022 School Health Profiles, 16% of schools nationwide lack a PE curriculum aligned with SHAPE national standards, and 21% do not require PE specialists to follow a written curriculum (Centers for Disease Control and Prevention, 2024). Additionally, 23% of schools offer no PE-specific professional development, and nearly half (48%) do not assess their PE policies, practices or programs. Nationwide, 56% of schools permit waivers, exemptions or substitutions for PE, and only 42% enforce PE class size limits consistent with other subjects. These gaps may compromise both the quality and quantity of PE students receive.

Disparities exist in PE program content and delivery, with a school's socioeconomic status (SES) playing a significant role (Carlson et al., 2014). Schools in communities with low SES are less likely to have PE specialists, PE requirements or PA-supportive practices, like trainings to increase MVPA during PE, than schools in high-SES communities (Carlson et al., 2014; Johnston et al., 2007). This is concerning, as PE often provides the only safe, supervised PA opportunity for children from low-SES households (Institute of Medicine, 2013). Supporting PE programs in these communities is essential to reducing disparities in children's PA participation and overall health (Slater et al., 2012; Singh et al., 2012).

State and local policies can significantly influence PE content and delivery in U.S. K–12 schools by setting requirements that strengthen practices indefinitely (Keating et al., 2010; Nanney et al., 2010; Carlson et al., 2013). However, there is substantial variation across and within states and districts in written policies, including curriculum guidelines, PE specialist requirements, student outcome assessments and evaluation practices (SHAPE America, 2015; National Association for Sport and Physical Education, 2010). Some state PE policies also lack guidance on incorporating evidence-based content, such as SHAPE standards (Eyler et al., 2010). While no federal regulations govern PE in the U.S., the 2015 Every Student Succeeds Act (ESSA) recognized PE as part of a well-rounded education, making PE programs eligible for new funding streams (National Center on Safe and Supportive Learning Environments, n.d.-a; National Center on Safe Supportive Learning Environments, n.d.-b). Currently, ESSA's Title 1 funds, aimed at promoting educational equity, are allocated to states and distributed by local districts to schools with high percentages of low-income

students (Massachusetts Department of Elementary and Secondary Education, 2017). Each school then decides how to consolidate federal, state and local funds to improve their PE programs (U.S. Department of Education, 2015; The Leadership Conference Education Fund, 2016; Hampton et al., 2017; U.S. Department of Education, 2018).

Variability in state and local education department operations and the flexible use of Title 1 funding makes it difficult to assess the impact of education policy and practices on PE development and implementation in Title 1 schools. Therefore, the purpose of this study was to provide a foundation for understanding PE programs in Title 1 schools through the perspective of PE specialists. More specifically, this study aimed to summarize current PE policies and practices in Massachusetts (MA) Title 1 schools and identify factors influencing their development and implementation. Using an explanatory sequential mixed-methods design, the study gathered: (1) survey data from PE specialists about district/school PE policies and practices; (2) insights from interviews exploring barriers and facilitators influencing PE development and implementation. This work aims to enhance understanding of PE development and implementation in MA Title 1 schools and to generate findings that may have broader relevance (Cox et al., 2011; Barroso et al., 2005; Snelling et al., 2017).

## **2. METHODS**

### **2.1 Participants**

The study recruited PE specialists in MA public elementary schools (grades K–5) from districts receiving Title 1 funding in 2023–2024. In MA, a district can apply to receive Title 1 funding if at least 40 percent of the students are from low-income families (Massachusetts Department of Elementary and Secondary Education, 2017). Eligible school districts were identified using the MA Department of Elementary and Secondary Education (MA-ESE) website. Eligible schools were public, served grades K–5 and allocated Title 1 funding through a schoolwide program (i.e., funding allocated to all students, not just students classified as low income) (Massachusetts Department of Elementary and Secondary Education, 2017). The initial sample included 217 elementary schools across 25 districts (399 total districts in MA).

From the sample of eligible districts and schools, contact information for PE specialists, principals and district-wide PE coordinators was collected from the MA-ESE and school websites. The study received Institutional

Review Board (IRB) approval from Tufts University. Of the 25 eligible districts, two required additional district-level IRB approval. One of these two districts granted approval while the other did not, resulting in a final sample of 24 districts. From the final sample, 214 principals, 19 district-level PE coordinators and 108 PE specialists (total  $n=341$ ) were contacted. Eligible PE specialists were actively teaching in 2023–2024 with at least one year of elementary PE experience, confirmed via self-report. All PE specialists gave written informed consent prior to data collection.

## 2.2 Instrument Development

The self-report survey was based on the School Physical Activity Policy Assessment (S-PAPA) and adapted based on the following documents: MA state PE requirements, the 1999 MA Comprehensive Health Curriculum Framework (MA-CHCF), 2013 SHAPE national standards, SHAPE PE essential components, ESSA Title 1 requirements (Massachusetts Department of Elementary and Secondary Education, 2017) and the 2010 Healthy, Hunger-Free Kids Act (HHFKA) (National Association for Sport and Physical Education, 2010; Massachusetts Department of Elementary and Secondary Education, 2017; Lounsbery et al., 2013; U.S. Department of Agriculture, 2016). The S-PAPA reliably measures the quantity and quality of elementary school PA policies for PE, recess and before/after-school programs (Lounsbery et al., 2013). The final survey included 27 questions across three sections, using multiple-choice, dichotomous, completion, matrix, and Likert-scale formats (see Table 1).

**Table 1**

### *Survey Questions, Sources, and Additional Documents Consulted*

Survey Questions	Original Source	Documents Consulted
<i>Facilities typically available for PE</i>	S-PAPA #7	
<i>PE classes/week (average) students receive</i>	S-PAPA #21	
<i>Total minutes (average) of typical PE class period</i>	S-PAPA #22	
<i>Minutes (average) dedicated to active learning time</i>	Formative research	
<i>Typical number of students (average) in a PE class</i>	S-PAPA #23	
<i>Number of students relative to other subject areas</i>	S-PAPA #38	
<i>Who teaches PE at the school (percentage adding to 100%)</i>	S-PAPA #24	
<i>Written policy requiring you to follow specific PE standards (If yes, what standards)</i>	S-PAPA #8/9	
<i>Written policy requiring specific number of minutes/week or days/week of PE</i>	S-PAPA #10/11	SHAPE PE Components
<i>Written policy that specifies the maximum student-to-teacher ratio for PE (If yes, what)</i>	S-PAPA #12/13	MA PE requirements

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<i>Written policy that requires PE to test students' fitness levels (If yes, what test)</i>	S-PAPA #14/15	SHAPE PE Components
<i>Written policy that teachers must assign student grades in PE (If yes, how assigned)</i>	S-PAPA #16/17	SHAPE PE Components
<i>Written policy that allows students to substitute PE for other activities</i>		MA PE requirements
<i>Written policy that allows for waivers or exemptions from PE</i>		MA PE requirements
<i>Written policy that requires PE to be evaluated or reviewed annually (If yes, how often)</i>	S-PAPA #19/20	SHAPE PE Components
<i>Written policy that requires licensure of PE specialists</i>		MA PE requirements
<i>Requires professional development CEUs or credits</i>	Formative research	
<i>District have a licensed PE specialist serving as a PE coordinator</i>	Formative research	
<i>School family engagement policy (If yes, how well is the policy followed)</i>		ESSA Title 1 funding
<i>Local school wellness policy (If yes, how well is the policy followed)</i>		HHFKA requirements
<i>Are you provided with (no/partially/yes):</i>		MA PE requirements
<ul style="list-style-type: none"> <li>• additional staff development or training specific to PE</li> <li>• technical assistance or guidance for teaching PE</li> <li>• additional resources for PE classes</li> </ul>		
<i>Does your district have a PE curriculum you are required to follow (If yes, how well is the curriculum followed)</i>	S-PAPA #30	
<i>How frequently do you include the following in your PE curriculum (rarely, sometimes, often):</i>	S-PAPA #31 (a-c, e-g)	MA-CHCF and SHAPE National Standards
<ul style="list-style-type: none"> <li>• skill development</li> <li>• understanding movement concepts, principles and strategies</li> <li>• expressive movement patterns</li> <li>• physical fitness components</li> <li>• responsible personal and social behavior development</li> <li>• valuing PA for health benefits beyond PE</li> </ul>		
<i>As a PE specialist do you have (no, partially, yes): goals/objectives/expected outcomes</i>	S-PAPA #29 (a, c-e)	SHAPE PE Components
<ul style="list-style-type: none"> <li>• a scope and sequence of instruction</li> <li>• a sequential series of lessons</li> <li>• a planned assessment or evaluation of students</li> </ul>		
<i>How often are students required to do extra PA for disciplinary reasons</i>	S-PAPA #32	
<i>How often do classroom teachers withhold students from PE for disciplinary reasons</i>	S-PAPA #34	MA PE requirements
<i>How often do classroom teachers without students from PE to fulfill academic requirements</i>	S-PAPA #33	MA PE requirements
<i>How often is PE compromised because of competing demands for space</i>	S-PAPA #35	
<i>How many days/semester are PE classes cancelled (on average)</i>	S-PAPA #36	

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Abbreviations: Physical education (PE); School Physical Activity Policy Assessment (S-PAPA); Massachusetts (MA); Every Student Succeeds Act (ESSA); Healthy, Hunger-Free Kids Act (HHFKA); Society for Health and Physical Education (SHAPE); MA Comprehensive Health Curriculum Framework (MA-CHCF)

The semi-structured interview guide was developed using the Theoretical Domains Framework (TDF) and prior applications of the framework (Atkins et al., 2017; Weatherson et al., 2017). The TDF, a validated framework with 14 domains, helps categorize behavioral and organizational factors influencing implementation outcomes (Cane et al., 2012; Michie et al., 2005). The guide included 18 questions across 9 domains (see Table 2). Survey responses were reviewed before each interview, which occurred within 2-4 weeks of survey completion, and follow-up questions were added as needed to help qualitative data explain quantitative findings, as is customary in explanatory sequential mixed methods research designs (Creswell & Clark, 2017; Richards et al., 2023).

**Table 2**

*Theoretical Domains Framework (TDF) Domains, Definitions and Interview Questions*

TDF domain	Definition	Interview questions
Knowledge	How educators' awareness and familiarity with their school/districts' PE policies influences the development and implementation of PE	<ul style="list-style-type: none"> <li>• Tell me more about your district or school's policy to follow specific PE standards</li> <li>• Tell me more about your district or school's Family Engagement policy</li> <li>• Tell me more about your district or school's Local School Wellness Policy</li> <li>• Is there an adapted PE program for students with special needs in your school?</li> </ul>
Skills	How educators' training and experience influence the development and implementation of PE	<ul style="list-style-type: none"> <li>• Do you feel as though you have the necessary skills to implement your district or school's PE policies and practices?</li> </ul>
Beliefs about Capabilities	How educators' perceived confidence, comfort and control influence the development and implementation of PE	<ul style="list-style-type: none"> <li>• Are you confident in your ability to implement your district or school's PE policies/practices?</li> <li>• Do you feel as though you have autonomy or control in the content and/or delivery of your PE program?</li> </ul>
Professional role/identity	How educators' perceived professional role and identity influence the development and implementation of PE	<ul style="list-style-type: none"> <li>• As a physical educator, how important is incorporating these [items from survey question #21] into your PE curriculum?</li> </ul>
Goals	How educators' outcome expectations/goals influence the development and implementation of PE	<ul style="list-style-type: none"> <li>• Tell me more about your process for developing [fill in items from survey question #22 with a partially or yes response]</li> </ul>
Reinforcement	How evaluation and monitoring influence educators' development and implementation of PE	<ul style="list-style-type: none"> <li>• Tell me more about your district or school's policy that requires your PE program to be evaluated or reviewed</li> </ul>
Behavioral regulation	How educators' self-monitoring and action planning influence the	<ul style="list-style-type: none"> <li>• Does your school principal or administration check to ensure the district PE curriculum is being implemented?</li> </ul>

Environmental context and resources	development and implementation of PE How the environment and resources influence educators' development and implementation of PE	<ul style="list-style-type: none"> <li>• In the survey we asked about competing demands that influence the delivery of PE. These included disciplinary actions, academic requirements, space constraints and weather. Are there any other competing demands that influence the delivery of PE?</li> <li>• Are there any other situations or barriers that make it difficult to implement your district or school's PE policies/practices?</li> <li>• Please provide examples of the [fill in items from survey question #19 with a partially or yes response] you have received for PE classes</li> <li>• Are there any other facilitators or forms of support you have received that make it easier to implement your district or school's PE policies?</li> </ul>
Social influences	How the interpersonal relationships and support influence educators' development and implementation of PE	<ul style="list-style-type: none"> <li>• Do you feel supported by [other PE teachers/classroom teachers/school administrators/school district/parents/school community] when it comes to your PE program?</li> </ul>

A formative evaluation assessed the feasibility and usability of the survey and interview guide and process (James Bell Associates, 2018). The materials were tested with a former MA PE specialist who is currently executive director of Massachusetts Association for Health, Physical Education, Recreation & Dance (MA-HPERD), a nonprofit that supports health and PE through leadership, training and advocacy in MA (Massachusetts Association for Health, Physical Education, Recreation and Dance, 2024). Feedback on question format, length, clarity and relevance was used to revise the materials, which were then re-reviewed and approved by all authors. To collect a range of perspectives, "policy" use in the survey and interview guide was intentionally vague and open-ended, allowing for participant interpretation.

### 2.3 Procedures

Recruitment emails (with attached recruitment flyer) were sent to principals, PE coordinators and PE specialists between October 2023 and March 2024. Principals and coordinators were asked to forward study details to relevant PE specialists. Nonrespondents received up to two follow-up emails within 14 days, with phone calls made when possible. Once PE specialists expressed interest, they were sent a personalized Qualtrics

survey link, followed by up to two reminders. Surveys remained open for 30 days and included an informed consent document and a final question about interest in participating in a follow-up interview. Respondents received a \$20 gift card.

PE specialists who expressed interest in interviews were contacted via email up to three times to schedule a Zoom interview. Interviews were conducted by the first author, with a research assistant taking notes. Sessions were recorded with permission, transcribed verbatim and de-identified. Participants were not provided with transcripts for member checking; however, credibility was established through dual independent coding, inter-rater reliability assessment, and triangulation with quantitative survey data. Participants received a \$50 gift card for their time.

The estimated sample size for thematic saturation was calculated using a quantitative tool (Fugard & Potts, 2015). With an adjusted population theme prevalence of 30% and a requirement of two theme instances at 80% power, 9 participants from 9 districts were needed to identify barriers and facilitators of PE development and implementation.

## 2.4 Statistical Analysis

Excel was used for descriptive statistical analyses. Descriptive statistics for continuous data (mean $\pm$ SD) were calculated for all schools in MA, eligible districts and study sample districts using publicly available data from the MA-DESE (see Table 3). Summary statistics for categorical data (N (%)) were calculated for survey responses and are reported at the study sample level.

**Table 3**

*District-level Characteristics across Massachusetts (MA), the Eligible Districts and the Study Sample (M  $\pm$  SD)*

	Statewide N= 399 districts	Eligible districts <sup>a</sup> N=24 districts	Study sample <sup>a</sup> N=9 districts
# K-12 schools	1827 total	17.9 $\pm$ 13.5	24.9 $\pm$ 20.5
# of students enrolled	914,959 total	9282 $\pm$ 5726	11990 $\pm$ 7785
% Hispanic	25.1%	39.7 $\pm$ 20.6%	43.6% $\pm$ 7.7%
% African American	9.6%	11.2 $\pm$ 11.7%	11.6% $\pm$ 5.9%
% Asian	7.4%	6.8 $\pm$ 9.5%	9.3% $\pm$ 14%
% low income <sup>b</sup>	42.2%	61 $\pm$ 15%	66% $\pm$ 12.2%
% high needs <sup>c</sup>	55.8%	72.7 $\pm$ 12.2%	77% $\pm$ 8.3%
% students with disabilities <sup>d</sup>	20.2%	22 $\pm$ 3.3%	21.6% $\pm$ 3.3%

% first language not English	26%	38.7 ± 18.6%	42% ± 17.1%
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*Note.* All data obtained from the MA Department of Elementary and Secondary Education's website for the 2023-2024 school year. Data<sup>a</sup> presented are means of district-level data, unweighted for district size. Students<sup>b</sup> enrolled on October 1st who meet one of the following criteria: (1) identified as participating in state public assistance programs, including the Supplemental Nutrition Assistance Program, Transitional Aid to Families with Dependent Children, MassHealth, and foster care; or (2) certified as Low Income through the new supplemental data collection process, or (3) reported by a district as homeless. Students<sup>c</sup> who belong to one or more of the following groups: Students with Disabilities, current or former English Learners and/or Low-Income students. Students<sup>d</sup> who have an Individualized Education Program (IEP).

Thematic analysis of interview transcripts followed a two-stage deductive-inductive approach: (1) coding factors using a priori themes from TDF domains and the interview guide, and (2) analyzing content within nodes (TDF domains) to identify emergent subthemes (Weatherson et al., 2017). This approach, commonly used in TDF analyses, balances systematic assessment with flexibility for unanticipated themes (Weatherson et al., 2017). Two independent reviewers used NVivo software (QSR International, Burlington, MA) for data extraction. The first author created the initial codebook based on the interview guide and after coding two transcripts. Both reviewers coded in rounds, met periodically to discuss findings and refined the codebook as needed. Cohen's Kappa assessed inter-coder reliability. After all transcripts were coded, the first author conducted a second pass to identify subthemes and representative quotes, with subthemes classified as barriers or facilitators to PE development and implementation. To assess whether the inclusion of two PE specialists from the same district affected results, a sensitivity analysis was conducted by re-examining key themes after sequentially removing each participant from that district.

### 3. RESULTS

A total of 108 PE specialists were contacted directly, and an unknown number of additional specialists may have received forwarded messages from principals and PE coordinators. Of those, 16 (14.8%) consented and completed the survey. Of the respondents, 56% were female (n=9), all were licensed PE teachers, and their teaching experience ranged from 2 to 31 years (median=5, interquartile range (IQR)=6). Respondents represented 16 schools within 9 districts.

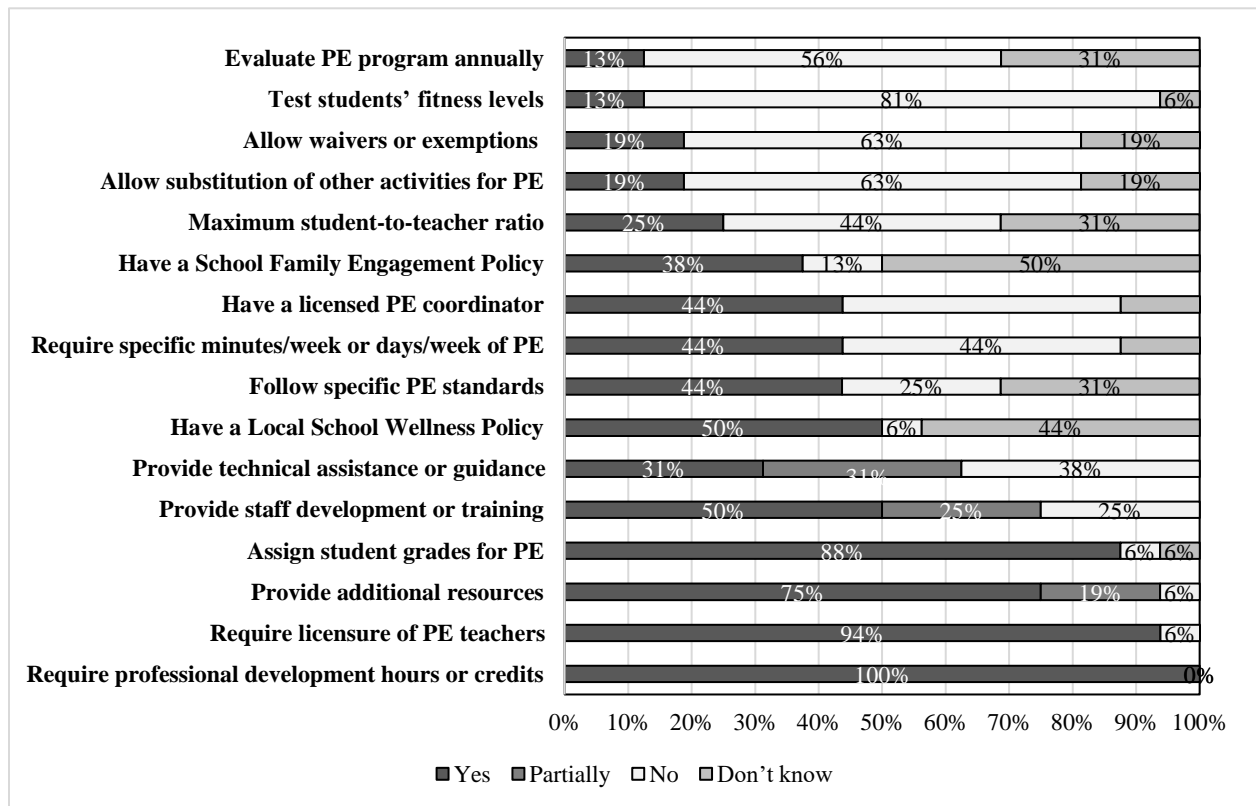
Descriptive characteristics across all districts in MA, the eligible districts for our study and the final study sample are displayed in Table 3. In

the schools in our study sample, 66% of students were classified as low income (versus 42% statewide) and 77% were classified as high needs (versus 56% statewide).

### 3.1 PE Practices, Policies and Program Content and Delivery

The median reported weekly PE frequency was 1 class/week (IQR=1), median weekly PE duration was 52.5 minutes (IQR=52.5), median active learning time was 30 minutes/class (IQR=6.25) and median class size was 20 students (IQR=5.5). Overall, 69% of PE specialists reported having a required K-12 PE curriculum. Additional survey findings about PE practices and policies are available in Figure 1.

**Figure 1**  
*Survey Responses about PE Policies or Practices at the School-level*



When asked about PE curriculum elements, respondents reported the following: 94% "often" included personal and social behavior development, 88% skill development, 75% valuing PA for health benefits, 69% movement

concepts, 56% physical fitness components and 25% expressive movement patterns. Regarding PE program content and delivery, 100% reported having goals, objectives or expected outcomes, 75% a scope and sequence of instruction, 75% a sequential series of lessons for learning and 38% a planned student assessment or evaluation. When asked about disruptions to PE delivery, 50% of respondents said teachers "never" withheld students for disciplinary reasons, 44% said teachers "never" withheld students for academic requirements and 13% reported PE was "never" compromised by space demands. On average, PE was canceled  $2.3 \pm 5.5$  days per semester.

### **3.2 Factors Influencing PE Development and Implementation**

Interviews were conducted with 10 PE specialists (62.5% response rate from survey sample; 50% female) from 9 districts (only 1 district with 2 specialists). When assessing data coding reliability, the overall unweighted kappa value was 0.68, with thematic categories ranging from 0.51 to 0.88, indicating substantial coder agreement and reliable coding application (Landis & Koch, 1977). Nine TDF domains were selected as a priori themes based on prior research by Cane et al. (2012) and Nathan et al. (2018), who identified these domains as most relevant to school-based physical activity implementation. Sensitivity analysis findings indicated that key themes remained stable regardless of whether each participant from the same district was included, suggesting that themes were not disproportionately influenced by a single school context and may reflect broader patterns across participants (Noyes et al., 2024). Table 2 provides descriptions of these domains and corresponding interview questions, while Table 4 summarizes the subthemes and identifies barriers and facilitators by TDF domain.

**Table 4***Interview Subthemes, Barrier/Facilitator Descriptions and Sample Quotes TDF Domain*

TDF Domain	Subthemes	Description	Barrier (X)	Facilitator (X)	Sample Quote
<i>Professional role and identity</i>	Group identity	Find a common identity as a physical education (PE) specialist within the larger PE community		X	<i>"So, like bunch of PE teachers get on, and it's like some of the best professional development I've been a part of, because, like people know exactly what you're going through...Because it can be isolating as a PE teacher, you're just in your little space... The only people you see are the ones who come to your room. So [the professional development with other PE specialists] has been super helpful."</i>
		Strong online community		X	<i>"And it's just that that, I can't speak enough about what's out there on social media and the PE community that I rely on to ask questions and get resources from and all this stuff."</i>
	Professional boundaries	Must set boundaries with other educators	X		<i>"You got to be strong on [setting boundaries]. Otherwise, the teachers will walk all over you for sure."</i>
	Professional responsibilities	Involvement in district's curriculum development creates a sense of agency			X
		Their responsibility to seek out professional development opportunities	X		<i>"The extra resources and funding and support was all stuff that I did. So, like I filled out the grant work. I applied to like go to conferences and go to extra professional development with, like other organizations."</i>

		Commitment to students' development and learning	X	"I think in another time I'd probably be done with this job already, but I think...I can push through for [them]... I've been with these kids for 4 years now so [I] just want to see what happens to them [developmentally]. I want to see them learn and grow [in their PA skills]."
<i>Social influences</i>	Support (district, school or larger PE community)	District-level support for PE is inconsistent from year to year and varies by person	X	"If you had asked me [if I felt supported] last year I would have been like no, no, I don't feel supported. I feel they don't think of PE as anything other than a break for the teachers, and they don't see us as equal to any of the other educators in this district. But now I feel a lot better. I feel like there are certain leaders in the district that are definitely very supportive of PE. I know of a couple that have been very outspoken about PE. So, I feel a lot better than I have in the past."
		Would like more specialized and frequent feedback from district-level PE coordinator	X	"If you ran a good PE program at your school and you had a director that had a PE background... they would be in your schools two, maybe three times a year just to see what we're doing, where we're at." "I try to hit all the elements of a well-rounded skill acquisition, but I don't have much of an evaluation or observation [from my district coordinator] saying that it's working or not working."
		Feel supported by the school (admin./teachers), but must be an advocate to receive	X	"Yeah, as far as resources, anything I ask for they give me, but I have to ask and advocate, so I wouldn't say it's just handed to me." "I was supported if I advocated enough...like we really need this equipment, or I really want to do this activity. They would give me the okay for the most part."
		Find support from the larger PE community, both	X	"The PE community throughout the world or throughout the country, has been super

		in the district/state or online			<i>helpful...PE teachers are very supportive of each other. I found that it's kind of the whole reason why I'm still [teaching].</i>
	Students or families	Experience a lot of behavioral issues with students that impacts class quality and quantity	X		<i>"The behaviors definitely interfere with my ability to be able to go over anything remotely close to skill development." "So, I'm going to say, probably 70% of the time during that 40 min of classes spent on trying to redirect problem behaviors...Simple, simple things like just following directions."</i>
<i>Knowledge</i>	District standards/curriculum	Aware of district policy to follow standards, but unaware of requirements/accountability for implementation	X	X	<i>"There's not a lot of oversight over PE because everyone's so concerned about English and math and science. It's easier for me to kind of fly under the radar and do a good job and do what I think is important." "I respect the fact that you're not holding me to something that's 20 plus years old. But also, you're not holding me to any standard. You're just like we trust [you], do whatever to get the kids moving."</i>
	Adaptive PE policies	Districts do not have clear policies for adaptive PE and educators don't know what the best approaches are for implementation	X		<i>"We hear "inclusion, inclusion, inclusion" and it's like, but is it good inclusion? So [adaptive PE policies are] kind of a mess and [our district] needs to work through it."</i>
	Family engagement policies	Unaware if district/school has any official family engagement policies as outlined in the ESSA	X		<i>"Like we do [family engagement]. I don't know if we have a policy on it." "I guess I don't. I don't know if I like recall seeing like a specific family policy on it."</i>
	School wellness policy	Unaware of school wellness policy and whether a wellness council exists	X		<i>"I don't believe there's a wellness council or committee. If there was, there would be several physical education teachers on that. I haven't heard anything from my boss, so I feel like there's not one."</i>
	Leadership structure	Inconsistencies in district-level PE coordinator role leaves educators confused	X		<i>"We never got any communication or an org chart type of thing. I don't know [if we, as PE teachers] land underneath [the PE coordinator], or if we still [report] to [our]</i>

		and without reliable support		<p><i>principal? I'm not sure if [the PE coordinator] is taking with my [principal] or just helping guide us."</i></p> <p><i>"We were without a [PE] director all last year. It's just a position that they left open... A lot of people were confused if [the district was] trying to eliminate those director positions, and if we were the guinea pig to see if it would work."</i></p>
<i>Environmental context and resources</i>	Schedule/time	Schedules vary between districts and sometimes within a school	X	<p><i>"Not every kid in our school gets PE...there are some classes that don't get PE all year. [Those classes] get dance instead of PE...And when there's a year or two gap of not having PE, we have to retrace all the steps. It's really time consuming and [prevents us from] getting to grade level content and skills."</i></p>
	Space	Space constraints/shared spaces are a concern	X	<p><i>"My district is tricky because we're all in gyms where we have more than one group learning at the same time...I have K-4 students on one side and the other teacher has 5-8 students on the other side [of the gym]. And we share [a space] a little bit larger than a basketball court. So, it's hard to be effective in that space."</i></p> <p><i>"I have my own space. However, our music teacher teaches on the stage on the other side of the curtain. So that's at times is very difficult for both of us... it is very difficult and frustrating at times."</i></p>
	Budget or equipment	Budget does not cover all necessary items	X	<p><i>"[The budget we get is] gone immediately...I don't know if you've ever looked at a Gopher catalog before, but you get about four basketballs and two footballs for \$800."</i></p>
		Lesson planning is limited by equipment availability	X	<p><i>"You could lay out this 100+ day lesson [plan]. But you know half of [the lessons] may not apply to some of the [teachers] just because they don't have the equipment."</i></p>

	School-wide coordination	Students are sometimes withheld from PE	X		"I understand why they [pull kids from PE], because they don't want to take them out of their classroom. But PE is going to also help them in the classroom. So can you stop pulling them for extra reading time. You're going to make a seven-year-old sit all day, and then the one time they get to go outside to play, you're going to take that away from them."
		Gym space can be taken away for other school events	X		"I have a gym, but sometimes [I am] bumped out of there because of whatever the case may be, assemblies or scholastic book fair. We had vision and hearing checks one time, and they push me out of [my gym]."
Goals	Curriculum planning	Not always able to achieve curriculum goals, must remain flexible with planning	X	X	"I can't fit all the units in that we have. So, I started rotating some of them. I'll switch [lessons] in and out so that [each student is] getting exposure to everything. But [the students are] not going to get every lesson every year because I can't put it all in." "When you are trying to teach motor development skills and you only get [the students] for a little chunk of time each week, you have to start over every week."
	District or school priorities	PE is not a top priority in districts/schools; there is variability	X		"It kind of depends on who my school administration is...So I wouldn't say that there's strong rigor right now to making sure that it's the PE standards that come first."
		There is limited accountability	X		"There wasn't ever anything strictly in place to make sure that [a specific] standard was hit or to prove that you're hitting standards. I've never had to do any of that."
Beliefs about capabilities	Confidence/self-efficacy	Perceived confidence in abilities and skills		X	"I don't use the support [from the PE coordinator] as much. I feel confident in what I'm doing." "Going to [college] for [PE] helped give me the skills. On top of that I think I've done a

	Comfort	Perceived comfort teaching some items could be better	X	<p><i>lot of professional development activities and sessions."</i></p> <p><i>"I'm on in front of the kids all the time, but my comfort level with some things isn't all there. So, I kind of [choose] other topics to get through that."</i></p> <p><i>"There are several activities that I would love to either see somebody else teach, or I would like to get some more strategies to be able to teach myself...because I'm not so comfortable teaching [those topics] and I would like to be more comfortable."</i></p>
	Control/autonomy	Perceived autonomy over programming	X	<p><i>"My first year I created my own curriculum for my building with all the equipment available to me at that time. Since then, I have added equipment and added things to that curriculum, taking things out, changing things up. I have total control."</i></p>
		Perceived lack of control over the environment/student behaviors	X	<p><i>"I find it hard for kids that are in the after-school program [in the gym] to understand that I'm not an after-school program, and it's not a free for all [during class time]. So, when they're in [my] class, it's harder to get them into the mindset that this is a classroom and [you need to] respect the gym. [It feels like I'm] swimming against the tide [with them] ...they just get bored [and then they] root through your stuff. So, I have to lock up [all the equipment] and be really cautious about what is left out."</i></p>
<i>Behavioral regulation</i>	Self-monitoring and student assessments	No universal system for monitoring implementation or students' progress	X	<p><i>"Grading is very difficult. It's hard to keep track of and I have not found a system that isn't stressful. I've tried all different things...across the state there should be a universal [system]...I'm surprised there's not something that everybody uses [to keep track of grades]."</i></p> <p><i>"I wish there was some sort of [system] where [grading] could be computerized...I'm</i></p>

		No district/school requirements for student assessments	X	<i>[using] a traditional piece of paper checklist and I have so many students there's no easy way to do it. It's time consuming."</i> <i>"At our school, specialist grades are not given the attention or oversight that they need to really assess kids. I have things that I do...there's a lot of self-assessments for kids, there's partner assessments and [I] assess them on personal and social responsibility...but [it's all] vague."</i>
<i>Skills</i>	Skill competence	Limited by inadequate guidance	X	<i>"We just don't have enough guidance. The students that come into our school feel broken, and they feel like we're just there to yell at them, and I know that's probably a horrible feeling for them."</i>
	Skill development	Opportunities provided by district/school are insufficient	X	<i>"I think we're lacking in providing specials with quality professional development that's relative to us."</i> <i>"I didn't get any sort of [PE specific] training [from the district]. We do have professional development days, but they don't do anything PE specific. It's us sitting in on the newest math curriculum, because they don't know where to put us. I don't feel I have any professional development that's useful for [PE specifically]."</i>
		When seek out own opportunities, find quality training	X	<i>"One day I observed an esteemed PE teacher. That was cool. But, if I want to get what I [need to be successful], I have to do it myself."</i>
<i>Reinforcement</i>	Evaluation of teaching	Inconsistencies in quantity of evaluations	X	<i>"It's probably been ten years since my district [PE coordinator] came in [to evaluate me]. It's usually my principal."</i> <i>"[I] haven't been evaluated in three years. The fact that nobody's seen me teach in the gym for three years... Asking for a whole program evaluation would be like asking somebody to climb Everest...That's tough."</i>

Accountability of evaluation is dependent on educators' tenure

X

*"So, in the first three years in the district, you have a meeting to go over your evaluation...and then they just come in once a year to do the evaluation and they can meet with you if you request it, but they don't require [the post evaluation meeting] anymore."*

Evaluations are neither PE-specific nor comprehensive

X

*"I don't think that [my principal] knows that there are PE standards that I'm teaching to. I make up lesson plans that have [the standards listed] on there, but I don't know that [the principal] looks at them. So, nobody's seeing whether I'm teaching based on standards or teaching based on the district curriculum."*

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**Professional role and identity.** PE specialists reported feeling isolated, often being the only PE specialist in their school. This isolation led them to seek connection with the broader PE community, fostering a shared professional identity that helped buffer stress, such as losing gym space for events. While seasoned PE specialists found it easier to maintain professional boundaries (i.e., telling another teacher "no" when asked to keep a student longer for coursework), newer educators struggled with this, seeing it as a barrier to the implementation of PE. PE specialists involved in curriculum development within their district felt agency, which facilitated implementation of curriculum requirements. However, specialists noted that they had to independently seek out PE-specific professional development, limiting their participation in trainings and serving as a barrier to further PE development. Despite these challenges, a strong commitment to students' growth and learning remained a facilitator of their work.

**Social influences.** PE specialists reported inconsistent district-level support, varying by person and year, which served as a barrier to PE development and implementation. They expressed a desire for more specialized, frequent feedback from district PE coordinators. At the school level, specialists felt supported but noted the need to actively advocate for that support, which became a facilitator to PE when successful. The broader PE community provided valuable resources and emotional support, further facilitating PE development and implementation. However, student behavioral issues regularly negatively affected PE by limiting teaching time and content quality.

**Knowledge.** PE specialists were generally aware of district policies to follow specific standards but were unclear about implementation requirements and accountability measures. Adaptive PE policies were seen as vague, with districts providing limited guidance on content and delivery, creating a barrier to implementation. Specialists were also largely unaware of family engagement policies required by ESSA, as well as the existence of school wellness policies or councils as required by the HHFKA. Where applicable, this lack of knowledge hindered policy implementation. Additionally, inconsistencies in the presence of a district-level PE coordinator from year to year caused confusion and unreliable support, further complicating PE development and implementation.

**Environmental context and resources.** PE specialists discussed several environmental barriers to PE development and implementation. Class schedules and time allotted for PE varied significantly across and within districts, with some classes receiving less time than others. Space limitations, such as sharing gym space or lacking access to a gym entirely, also posed challenges for PE content and delivery. Budget constraints were

another barrier, as allocated funds were quickly exhausted and insufficient for necessary equipment. Additionally, inconsistent school-wide coordination occasionally resulted in students being withheld from PE for other coursework or events, though these occurrences were perceived as infrequent.

**Goals.** PE specialists reported setting professional goals to incorporate specific content into their curriculum, but external factors like student behavior and time limitations often required them to adjust plans and prevented goal achievement. They felt that PE was not always a district or school priority, with significant variability across schools and administrations. This variability in prioritization, combined with limited accountability and oversight, created barriers to the consistent development and implementation of PE.

**Beliefs about capabilities.** PE specialists generally felt confident in their teaching abilities and skills, which supported PE development and implementation. However, some reported lower comfort with specific topics, like expressive movement patterns (dance), creating a barrier to educators' proposed curriculum implementation. While specialists perceived full autonomy over curriculum content, they felt limited control over the teaching environment and student behavior. Their autonomy facilitated flexible PE development, but the lack of environmental control hindered implementation.

**Behavioral regulation.** PE specialists lacked a standardized system for tracking PE program implementation or monitoring student progress. This, combined with the absence of district or school requirements for student assessments, created barriers to the further development and implementation of PE.

**Skills.** PE specialists reported feeling competent in some skills, such as engaging families and finding resources. However, they noted that limited district or school guidance hindered their overall perceived competency. They described district-provided professional development for PE as insufficient and often sought external opportunities to obtain the quality training needed for developing and implementing quality PE.

**Reinforcement.** PE specialists reported inconsistent evaluations from administrators or PE coordinators, with accountability levels varying by tenure (i.e., PE specialists with more tenure were typically held less accountable). Evaluation criteria were typically not PE-specific and did not assess aspects of PE content or delivery (e.g., did not assess what PE

standards specialists were following). This lack of tailored feedback hindered specialists' ability to gauge progress and prioritize areas for improvement.

#### **4. DISCUSSION**

Our study reveals insights for policy, systems, and environmental changes for supporting quality PE development and implementation in Title 1 schools. Survey results revealed that only 50% of PE specialists received PE-specific staff development, and just 31% had access to technical assistance for teaching. Interviews further explored these challenges and highlighted that limited access to professional development remained a barrier. This lack of access constrained educators' knowledge and confidence, ultimately impeding PE development and implementation, an issue previously noted in the literature (Morgan & Hansen, 2008). Despite additional challenges with managing student behaviors and setting boundaries with colleagues, PE specialists maintained a strong sense of professional identity. Future efforts should address these factors by offering more classroom management support and professional development opportunities while leveraging the strong group identity and dedication PE specialists demonstrate.

Survey data indicated that only 12.5% of PE specialists reported an annual evaluation requirement for their PE programs. Interviews revealed that social influences, such as support from the school or broader PE community, can facilitate implementation, but inconsistent support, infrequent evaluations/feedback, and student behavioral issues often act as barriers to both development and implementation. These findings align with prior research highlighting that limited support from parents, students, administrators or school boards can impede PA policy and practice implementation (Weatherson et al., 2017; Nathan et al., 2018). A more coordinated, school-wide approach, such as establishing school health advisory councils or appointing subject-specific coordinators, could strengthen social support that facilitates PE development and implementation (Chung et al., 2023; Rasberry et al., 2015). Consistent infrastructure that provides regular feedback, supports professional growth and addresses student behavior is important to improving PE in Title 1 schools.

PE specialists' knowledge of district and school PE policies varied, hindering implementation. Survey results showed that 44% of respondents knew of a written policy to align their PE program with PE standards, 25% believed no policy existed and 31% didn't know. Interview findings indicated that even when specialists were aware of policies, they often lacked clarity

regarding implementation and accountability. For ESSA-related practices, such as family engagement policies across school subjects, 50% of specialists were unaware if such a policy existed in their school, preventing policy implementation in PE classes. Research suggests that clear, comprehensive written policies can significantly improve implementation practices and outcomes (Chriqui et al., 2009; Schwartz et al., 2012). Clear policies should also be appropriately disseminated among key leaders and PE specialists. Future policy revisions and support strategies should use clearer language, establish transparent reporting practices and define leadership roles, such as that of the PE coordinator, to improve knowledge of and expectations about PE policies and practices in Title 1 schools.

Environmental factors like school schedules, limited class time, space constraints and budget issues primarily acted as barriers to consistent PE implementation. For example, these challenges made it difficult to deliver sequential lessons for skill acquisition, a common PE curriculum goal cited by PE specialists. Additionally, poor school-wide coordination sometimes resulted in students being withheld from PE class or the gym being repurposed for other events. These barriers mirror findings from previous studies on implementation of school wellness policies (Agron et al., 2010). While systemic changes are necessary for long-term improvements, strategies with immediate impact may include mandating minimum PA minutes in PE class or identifying supplemental funding sources in policy documents (Carlson et al., 2013; Agron et al., 2010). Districts might also consider adapting PE curricula to address time, space, or equipment limitations and hiring PE coordinators to provide context-specific support.

PE specialists set goals for curriculum planning and family engagement but faced external constraints that hindered goal achievement. To adapt, they incorporated flexibility into their PE program development. This aligns with health promotion research highlighting the absence of a plan for addressing goals as a barrier to implementation (Hung et al., 2014). In this study, district and school competing priorities, along with varying levels of accountability, significantly influenced PE in Title 1 schools. When PE is deprioritized compared to other subjects, this lack of prioritization becomes a persistent obstacle to delivering quality instruction (Barroso et al., 2005). Previous research suggests that district and school leaders must first recognize PE as a priority before discussing PE support strategies (Snelling et al., 2017). Implementing systems to monitor PE policies and practices may help improve accountability and support more consistent PE delivery (Nathan et al., 2018). Future studies should investigate the impact of such strategies on PE in Title 1 schools.

#### 4.1 Implications for School Health Policy, Practice and Equity

Understanding PE development and implementation in Title 1 schools is a crucial first step in improving school health environments. Identifying the factors that influence these processes helps key leaders target barriers and provide the necessary resources, support or leadership. While districts oversee PE development and implementation in schools, state-level guidance can influence these practices. Therefore, recommendations from this study are primarily directed at state-level leaders but remain applicable to district and school administrators (Chriqui et al., 2013).

Based on our findings, and previous school health literature, we believe a coordinated and tailored approach of the following policy, systems and environmental changes and support strategies is most pertinent in helping Title 1 schools achieve quality PE. We recognize that many of these strategies require time and resources that are often limited in Title 1 schools; however, acknowledging these constraints can help guide the development of feasible, context-specific solutions.

1. **Build Infrastructure for Quality PE.** Leverage PE specialists' strong group cohesion and commitment to their professional role by providing greater access to professional development and fostering supportive partnerships at multiple levels (e.g., state, district, school and community) (Lee et al., 2023). Infrastructure efforts should clearly communicate to all actors that quality PE development and effective implementation is essential for achieving intended student health benefits (Agron et al., 2010).
2. **Write Clear, Strong and Comprehensive PE Policies.** Craft clear, detailed policies with well-defined adoption and implementation strategies. Strong policy language is associated with better implementation (Schwartz et al., 2012; Taber et al., 2012; Chriqui et al., 2021), school-level practices (Chriqui et al., 2013; Larson et al., 2016; Perna et al., 2012), and child-level outcomes (Cornett et al., 2023; Taber et al., 2013; Lin et al., 2020). To address knowledge barriers, pair clear policies with increased communication and awareness-building among key leaders and PE specialists. This approach can be an equitable, cost-effective solution for districts with limited funding, staffing or resources (Schwartz et al., 2012).
3. **Incorporate Flexibility in PE Development and Implementation.** *Given the varying impact of environmental factors on PE, schools and*

*districts can benefit from tailoring strategies to fit available resources (Cornett et al., 2023). State education agencies can support this by developing adaptation guidelines or identifying and disseminating model policies as templates (Taber et al., 2012). This approach may reduce inconsistencies in PE practices while addressing context-specific barriers without adding unnecessary burden (Kearns, 2022).*

4. **Prioritize PE with Ongoing Monitoring.** *State PE mandates strongly influence school priorities (Dauenhauer et al., 2019). State leaders should set clear accountability standards, monitor compliance and provide feedback to support continued PE development and implementation (Chung et al., 2023; Schwartz et al., 2012). Regular evaluation and monitoring can help identify barriers and tailor strategies to enhance PE prioritization at all levels of influence (Carlson et al., 2013).*

## 4.2 Limitations

This study has several limitations attributable to recruitment and data collection procedures. Data were collected from Title 1 districts in MA, which may limit generalizability to non-Title 1 districts or other states. Findings are based on PE specialists' self-reports, which could introduce two types of response bias. If respondents were more knowledgeable or satisfied with the support they received than nonrespondents (i.e., differed in a meaningful way), then non-response bias may have impacted the findings by concealing other factors relevant for PE or providing a more positive view of the current state of PE in Title 1 schools. Additionally, reliance on self-report for all data may have introduced social desirability bias. Future research efforts should consider broader recruitment efforts and using school environment observation tools or policy document analyses to provide additional perspectives and more objective insights into PE development and implementation practices.

Data collection occurred between October 2023 and March 2024. At the time of survey design, MA followed the 1999 version of the MA-CHCF (Massachusetts Department of Elementary and Secondary Education, 1999). However, in September 2023, a new framework was released, which may have influenced responses despite researchers' efforts to gain clarity on which framework a specialist was referring to in their answers (Massachusetts Department of Elementary and Secondary Education, 2023). The ongoing impact of the new standards on PE warrants follow-up research,

as these changes may continue to shape policies and practices over time and provide valuable insights for key leaders in MA.

## **5. CONCLUSIONS**

This study systematically identified current policies and practices and the modifiable factors influencing PE development and implementation in Title 1 elementary schools. Despite substantial barriers including limited resources, unclear policies, and inconsistent support systems, PE specialists' strong professional identity and community support provide critical facilitators that can be leveraged to improve PE quality. The findings help prioritize strategies that target these factors and enhance the quality of PE policies and practices in MA (Weatherson et al., 2017). Future research should continue to track these processes and their impact on student outcomes to support data-driven policy and practice adjustments (Taber et al., 2013; Lin et al., 2020; Evenson et al., 2009).

The mixed-methods results provide useful insights for other state-level PE advocates, researchers and specialists working to promote and support quality PE programs in Title 1 schools. A coordinated approach to developing, implementing, monitoring and enforcing PE policies and practices is essential (Carlson et al., 2013). Strengthening policy, environmental and systems-level support for PE in Title 1 schools can help improve school-level PA outcomes and advance health equity for school-aged children in the U.S.

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### **6.2 Conflict of Interest**

The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

### **6.3 Contribution of Authors**

BCW: study design, data collection, data analysis, manuscript preparation, manuscript editing; JMS: study design, manuscript editing;

DPH: study design, manuscript editing; KC: study design, manuscript editing; MM: study design, manuscript editing; SH: data collection, data analysis, manuscript editing; EH: study design, manuscript editing

## 7. REFERENCES

- Agron, P., Berends, V., Ellis, K., & Gonzalez, M. (2010). School wellness policies: Perceptions, barriers, and needs among school leaders and wellness advocates. *Journal of School Health, 80*(11), 527–535.
- American Heart Association. (2019). *Increasing and improving physical education and physical activity in schools*. Author.
- American Public Health Association. (2021). *Supporting physical education in schools for all youth*. Author.
- Aspen Institute. (2015). *Physical literacy: A model, strategic plan, and call to action*. Author.
- Atkins, L., Francis, J., Islam, R., O'Connor, D., Patey, A., Ivers, N., Foy, R., Duncan, E. M., Colquhoun, H., Grimshaw, J. M., Lawton, R., & Michie, S. (2017). A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. *Implementation Science, 12*(1), 77.
- Barroso, C. S., McCullum-Gomez, C., Hoelscher, D. M., Kelder, S. H., & Murray, N. G. (2005). Self-reported barriers to quality physical education by physical education specialists in Texas. *Journal of School Health, 75*(8), 313–319.
- Cane, J., O'Connor, D., & Michie, S. (2012). Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implementation Science, 7*(1), 37.
- Carlson, J. A., Mignano, A. M., Norman, G. J., McKenzie, T. L., Kerr, J., Arredondo, E. M., Madanat, H., Cain, K. L., Elder, J. P., Saelens, B. E., Glanz, K., Lifting, S. M., & Sallis, J. F. (2014). Socioeconomic disparities in elementary school practices and children's physical activity during school. *American Journal of Health Promotion, 28*(3\_suppl), S47–S53.
- Carlson, J. A., Sallis, J. F., Chiqui, J. F., Schneider, L., McDermid, L. C., & Agron, P. (2013). State policies about physical activity minutes in physical education or during school. *Journal of School Health, 83*(3), 150–156.
- Carlson, J. A., Sallis, J. F., Norman, G. J., McKenzie, T. L., Kerr, J., Arredondo, E. M., Madanat, H., Mignano, A. M., Cain, K. L., Elder, J. P., Glanz, K., Lifting, S. M., & Saelens, B. E. (2013). Elementary school practices and children's objectively measured physical activity during school. *Preventive Medicine, 57*(5), 591–595.

- Centers for Disease Control and Prevention. (2013). *Comprehensive school physical activity programs: A guide for schools*. U.S. Department of Health and Human Services.
- Centers for Disease Control and Prevention. (2019). *Increasing physical education and physical activity: A framework for schools*. U.S. Department of Health and Human Services.
- Centers for Disease Control and Prevention. (2024). *School health profiles 2022*. <https://profiles-explorer.cdc.gov/>
- Chriqui, J. F., Eyster, A., Carnoske, C., & Slater, S. (2013). State and district policy influences on district-wide elementary and middle school physical education practices. *Journal of Public Health Management and Practice, 19*(3 Suppl 1), S41–S48.
- Chriqui, J. F., Leider, J., Turner, L., Piekarcz-Porter, E., & Schwartz, M. B. (2021). State wellness policy requirement laws matter for district wellness policy comprehensiveness and wellness policy implementation in the United States. *Nutrients, 13*(1), 188.
- Chriqui, J. F., Schneider, L., Chaloupka, F. J., Ide, K., & Pugach, O. (2009). *Local wellness policies: Assessing school district strategies for improving children's health 2006–07 and 2007–08*. Robert Wood Johnson Foundation.
- Chung, C. S., Sliwa, S. A., Merlo, C., Erwin, H., & Xu, Y. (2023). Coordinated approach: Comprehensive policy and action planning. *Journal of School Health, 93*(9), 853–863.
- Cornett, K., Murfay, K., & Fulton, J. E. (2023). Physical activity interventions during the school day: Reviewing policies, practices, and benefits. *Journal of School Health, 93*(9), 778–787.
- Cox, L., Berends, V., Sallis, J. F., Webber, L. S., Ward, D., Lytle, L. A., Slawson, D. L., & Felton, G. (2011). Engaging school governance leaders to influence physical activity policies. *Journal of Physical Activity & Health, 8*(Suppl 1), S40–S48.
- Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. SAGE Publications.
- Dauenhauer, B., Keating, X., Stoepker, P., & Knipe, R. (2019). State physical education policy changes from 2001 to 2016. *Journal of School Health, 89*(6), 485–493.
- Evenson, K. R., Ballard, K., Lee, G., & Ammerman, A. (2009). Implementation of a school-based state policy to increase physical activity. *Journal of School Health, 79*(5), 231–238.
- Eyster, A. A., Brownson, R. C., Aytur, S. A., Craddock, A. L., Doescher, M., Evenson, K. R., Galuska, D. A., Greco, E., Haire-Joshu, D., Lemon, S. C., Mudd, L. M., Oh, A., Pate, R. R., Petteway, R. J., & Schmid, T. L. (2010). Examination of trends and evidence-based elements in state

- physical education legislation: A content analysis. *Journal of School Health*, 80(7), 326–332.
- Fugard, A. J. B., & Potts, H. W. W. (2015). Supporting thinking on sample sizes for thematic analyses: A quantitative tool. *International Journal of Social Research Methodology*, 18(6), 669–684.
- Hampton, C., Alikhani, A., Auld, M. E., & White, V. (2017). Advocating for health education in schools [Policy brief]. Author.
- Hung, T. T. M., Chiang, V. C. L., Dawson, A., Lee, R. L. T., & Kokubo, Y. (2014). Understanding of factors that enable health promoters in implementing health-promoting schools: A systematic review and narrative synthesis of qualitative evidence. *PLOS ONE*, 9(9), e108284.
- Institute of Medicine. (2013). *Educating the student body: Taking physical activity and physical education to school*. National Academies Press.
- James Bell Associates. (2018). *Formative evaluation toolkit: A step-by-step guide and resources for evaluating program implementation and early outcomes*. Author.
- Johnston, L. D., Delva, J., & O'Malley, P. M. (2007). Sports participation and physical education in American secondary schools: Current levels and racial/ethnic and socioeconomic disparities. *American Journal of Preventive Medicine*, 33(4), S195–S208.
- Kearns, N. E. (2022). How small policy changes can transform the implementation of physical activity minutes in Kentucky public schools: A white paper. *Journal of School Health*, 92(2), 205–208.
- Keating, X. D., Lambdin, D., Harrison, L., & Dauenhauer, B. (2010). Changes in K–12 physical education programs from 2001 to 2006. *Research Quarterly for Exercise and Sport*, 81(2), 180–188.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159–174.
- Larson, N., Davey, C., Hoffman, P., Kubik, M. Y., & Nanney, M. S. (2016). District wellness policies and school-level practices in Minnesota, USA. *Public Health Nutrition*, 19(1), 26–35.
- Lee, S. M., Harwell, O. R., Sliwa, S. A., DuBose, K. D., Loftus, A. M., & Huberty, J. L. (2023). Transforming evidence into action: A commentary on school-based physical activity and nutrition intervention research. *Journal of School Health*, 93(9), 864–870.
- Lin, W., Leider, J., Shang, C., Hennessy, E., Perna, F. M., & Chriqui, J. F. (2020). The association between state physical education laws and student physical activity. *American Journal of Preventive Medicine*, 58(3), 436–445.
- Lounsbery, M. A. F., McKenzie, T. L., Morrow, J. R., Jr., Holt, K. A., & Budnar, R. G. (2013). School physical activity policy assessment. *Journal of Physical Activity & Health*, 10(4), 496–503.

- Massachusetts Association for Health, Physical Education, Recreation and Dance. (2024). *Our history*. <https://ma-hperd.org/our-history/>
- Massachusetts Department of Elementary and Secondary Education. (1999). *Physical activity and fitness*. Massachusetts Comprehensive Health Curriculum Framework.
- Massachusetts Department of Elementary and Secondary Education. (2017). *Massachusetts consolidated state plan under the Every Student Succeeds Act (ESSA)*. U.S. Department of Education.
- Massachusetts Department of Elementary and Secondary Education. (2017). *Schoolwide programs*. Author.
- Massachusetts Department of Elementary and Secondary Education. (2023). *Comprehensive health and physical education*. Author.
- Michie, S., Johnston, M., Abraham, C., Lawton, R., Parker, D., & Walker, A. (2005). Making psychological theory useful for implementing evidence-based practice: A consensus approach. *Quality & Safety in Health Care, 14*(1), 26–33.
- Morgan, P. J., & Hansen, V. (2008). Classroom teachers' perceptions of the impact of barriers to teaching physical education on the quality of physical education programs. *Research Quarterly for Exercise and Sport, 79*(4), 506–516.
- Nanney, M. S., Nelson, T., Wall, M., Haddad, T., Kubik, M., Laska, M. N., & Story, M. (2010). State school nutrition and physical activity policy environments and youth obesity. *American Journal of Preventive Medicine, 38*(1), 9–16.
- Nathan, N., Elton, B., Babic, M., McCarthy, N., Sutherland, R., Presseau, J., Seward, K., Hodder, R., Booth, D., & Wolfenden, L. (2018). Barriers and facilitators to the implementation of physical activity policies in schools: A systematic review. *Preventive Medicine, 107*, 45–53.
- National Association for Sport and Physical Education. (2010). *State profiles: Massachusetts*. Author.
- National Association for Sport and Physical Education. (2011, May). The National Association for Sport and Physical Education joins with The Century Council to promote National Physical Education and Sport Month [Press release].
- National Center on Safe and Supportive Learning Environments. (n.d.-a). *Title IV, Part A statute. Section 4108. Activities to support safe and healthy students*. <https://safesupportivelearning.ed.gov/title-iv-part-a-statute#Sec%204108>
- National Center on Safe and Supportive Learning Environments. (n.d.-b). *Title IV, Part A statute. Section 4107. Activities to support well-rounded educational opportunities*.

<https://safesupportivelearning.ed.gov/title-iv-part-a-statute#Sec%204108>

- Noyes, J., Booth, A., Cargo, M., Flemming, K., Harden, A., Harris, J., Garside, R., Hannes, K., Pantoja, T., & Thomas, J. (2024). Qualitative evidence. In J. P. T. Higgins et al. (Eds.), *Cochrane handbook for systematic reviews of interventions* (6.5 ed.). Cochrane.
- Perna, F. M., Oh, A., Chriqui, J. F., Hennessy, E., Eyler, A., Atienza, A., Buchanan, L. R., Cradock, A. L., Goins, K. V., Lemon, S. C., Schwarte, L., & Siddiqi, Z. (2012). The association of state law to physical education time allocation in US public schools. *American Journal of Public Health, 102*(8), 1594–1599.
- Physical Activity Council. (2017). *2017 participation report: The Physical Activity Council's annual study tracking sports, fitness, and recreation participation in the US*. Author.
- Raspberry, C. N., Slade, S., Lohrmann, D. K., & Valois, R. F. (2015). Lessons learned from the whole child and coordinated school health approaches. *Journal of School Health, 85*(11), 759–765.
- Richards, K. A., Gaudreault, K. L., & Mitchell, M. (2023). *Qualitative research and evaluation in physical education and sport pedagogy*. Jones & Bartlett Learning.
- Ridgers, N. D., Salmon, J., Parrish, A.-M., Stanley, R. M., & Okely, A. D. (2012). Physical activity during school recess: A systematic review. *American Journal of Preventive Medicine, 43*(3), 320–328.
- Schwartz, M. B., Henderson, K. E., Falbe, J., Novak, S. A., Wharton, C. M., Long, M. W., O'Connell, M. L., & Fiore, S. S. (2012). Strength and comprehensiveness of district school wellness policies predict policy implementation at the school level. *Journal of School Health, 82*(6), 262–267.
- SHAPE America. (2014). *National standards and grade-level outcomes for K–12 physical education*. Human Kinetics.
- SHAPE America. (2015). *The essential components of physical education*. Author.
- Singh, A., Uijtdewilligen, L., Twisk, J. W. R., van Mechelen, W., & Chinapaw, M. J. M. (2012). Physical activity and performance at school: A systematic review of the literature including a methodological quality assessment. *Archives of Pediatrics & Adolescent Medicine, 166*(1), 49–55.
- Slater, S. J., Nicholson, L., Chriqui, J., Turner, L., & Chaloupka, F. (2012). The impact of state laws and district policies on physical education and recess practices in a nationally representative sample of US public elementary schools. *Archives of Pediatrics & Adolescent Medicine, 166*(4), 311–316.

- Snelling, A., Belson, S. I., Watts, E., Malloy, L., Van Roekel, K., Lassiter, A., & Kisanuki, S. (2017). Measuring the implementation of a school wellness policy. *Journal of School Health, 87*(10), 760–768.
- Taber, D. R., Chriqui, J. F., & Chaloupka, F. J. (2012). Association and diffusion of nutrition and physical activity policies on the state and district level. *Journal of School Health, 82*(5), 201–209.
- Taber, D. R., Chriqui, J. F., Perna, F. M., Powell, L. M., Slater, S. J., & Chaloupka, F. J. (2013). Association between state physical education (PE) requirements and PE participation, physical activity, and body mass index change. *Preventive Medicine, 57*(5), 629–633.
- The Leadership Conference Education Fund. (2016). *Checklist for ESSA implementation*. Author.
- U.S. Department of Agriculture. (2016). Local school wellness policy implementation under the Healthy, Hunger-Free Kids Act of 2010. *Federal Register, 81*(146). Food and Nutrition Service.
- U.S. Department of Education. (2015). *Every Student Succeeds Act*. <https://www.ed.gov/essa?src=rn>
- U.S. Department of Education. (2018). *Understanding the Every Student Succeeds Act*. Author.
- U.S. Department of Health and Human Services. (2018). *Physical activity guidelines for Americans* (2nd ed.). Author.
- Weatherson, K. A., McKay, R., Gainforth, H. L., & Jung, M. E. (2017). Barriers and facilitators to the implementation of a school-based physical activity policy in Canada: Application of the theoretical domains framework. *BMC Public Health, 17*(1), 835.
- Webster, C. A. (2023). The comprehensive school physical activity program: An invited review. *American Journal of Lifestyle Medicine, 17*(6), 762–774.