Supporting Teachers' Implementation of Classroom-Based Physical Activity

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ABSTRACT

Research exploring factors related to teachers' implementation of classroom-based physical activity (CBPA) has increased in recent years. This article highlights key findings from the literature about the implementation and maintenance of CBPA by classroom teachers. The authors provide an overview of the literature examining CBPA implementation from an implementation science perspective. Topics addressed include methods for measuring implementation, characteristics of CBPA resources, and predictors of teachers' implementation of CBPA. Findings from the narrative review are presented in tandem with insights from the authors' work during a grant-funded project examining strategies to improve CBPA implementation in elementary schools. Many off-the-shelf resources for CBPA implementation exist, with varying degrees of implementation support. Studies have used a variety of methods to measure implementation, mostly focused on teacher self-report. Few studies have provided evidence regarding long-term use of CBPA, but those that do report decreased implementation rates over time. A robust body of research examining CBPA implementation facilitators and barriers shows that organizational-level support from district and school administrators is crucial for successful implementation. Leadership buy-in is crucial for the implementation of policies and practices in schools, such as CBPA initiatives. Approaches that are embedded within school systems, such as communities of practice and coaching from school champions, have potential for improving implementation. Disseminating CBPA resources and providing information about the importance of school and district leadership are suggested for more widespread implementation. Future work would benefit from the use of evidence-based implementation science frameworks to ensure that interventions are designed to maximize implementation at the classroom level.

INTRODUCTION

Children and adolescents should engage in 60 min of physical activity (PA) daily (1), with half of that occurring during school hours (2,3). Classroom-based physical activity (CBPA) helps students to accrue those 30 min of activity, complementing other PA opportunities at school, such as physical education (PE) class, recess, and walking or biking to school. Unlike other PA opportunities at school, however, the implementation of CBPA depends largely on decisions made by classroom teachers. Many classroom teachers do not have experience with implementing CBPA, and nationally representative data from the 2013 to 2014 school year indicated that CBPA was not widely used in elementary school classrooms across the United States (4).

The literature on CBPA is increasing rapidly, particularly in recent years. Several systematic reviews have summarized the evidence about the benefits of CBPA (5–9), and the articles in this special issue further synthesize the large volume of work that has been published in the past few years. CBPA benefits many student outcomes, including PA (10–13), fitness and weight outcomes (14–16), behavioral outcomes such as time on task (10,17–21), and academic outcomes such as grades and standardized test scores (22–24). Several randomized controlled trials have been conducted, or are currently underway, to examine an array of student outcomes subsequent to increased CBPA in schools (20,22,25–27).

The increasing evidence about CBPA's benefits for students indicates that it should be considered a best practice for elementary schools (2,3). However, given the low prevalence of use across the nation, it seems warranted to mobilize efforts to increase the number of classroom teachers who use CBPA and the consistency with which they do so. Yet, many questions remain about how best to encourage teachers' implementation of CBPA. This article reviews previous work exploring teacher-level implementation, including consideration of how CBPA implementation is measured and what is known about factors associated with implementation. We discuss interventions and potential innovations to support increased rates of implementation and sustained use of CBPA among classroom teachers. Our review of published evidence is supplemented with examples from our own work over the past 4 yr on the Physically Active Classrooms Energize! (PACE) project at Boise State University, which is supported by a research grant from the Institute of Education Sciences. On the PACE project,

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2379-2868/0417/0165–0172
Translational Journal of the ACSM

we have worked with 10 public elementary schools, focusing on improving the understanding of factors that increase teachers' implementation of CBPA and sustained use of the practice over time. Although student outcomes are also of interest, the PACE project focuses primarily on teachers, using mixed methods (surveys and interviews) to assess changes in teachers' knowledge and attitudes about CBPA and examination of how teacher and school characteristics are associated with subsequent changes in practices.

Teachers' CBPA Usage and How Implementation Is Measured

Considerable variation in how CBPA is conceptualized and measured can result in a lack of clear information about the use of this practice in schools. Many terms exist for the same general concepts, including activity breaks (1), brain breaks, active learning, and movement integration (28). They refer to efforts to promote PA at any intensity in the classroom and can include PA breaks, PA integrated with academic content, standing desks, or classroom design to maximize movement. Most work thus far has focused on PA breaks and physically active academic lessons. According the Centers for Disease Control and Prevention's nationally representative School Health Policies and Practices Study (29) in 2014, survey respondents at 43.3% of elementary schools reported that students "participate in regular PA breaks outside of physical education, during the school day." However, this does not provide an indication of how many teachers at each school use classroom-based PA strategies, or how often, which could be characterized as the "extent of implementation." Such data were reported by Turner and Chaloupka (4) using a nationally representative survey of principals at public U.S. elementary schools, also in 2013–2014. Those data indicated that active lessons were used by at least some classroom teachers at 71.7% of public U.S. elementary schools, and PA breaks were used at 75.6% of schools. At schools where PA breaks were used, 45.6% of teachers were participating, but generally for limited amounts of time, with very few principals estimating that students received ≥10 min of CBPA per day, on average. Thus, these large-scale surveillance studies show that although general use of CBPA can be considered somewhat high, regular and schoolwide use is low. However, studies that ask principals to serve as proxy reporters for classroom-level practices may be limited by incomplete knowledge or estimating biases, thus additional strategies are needed to assess implementation at the teacher (i.e., classroom) level.

Many studies have used teacher interviews to gather information about classroom-level practices (30–34). Although interviews may be subject to recall bias or inaccuracies when used to estimate the frequency and details of each teacher's CBPA practices, they yield rich data about barriers to implementation as well as successful strategies. In addition to interviews, many studies have used surveys, observations, and other approaches to assess classroom practices—often such approaches are used to gather process measures (35) during interventions, such as the fidelity of intervention delivery (10,36,37). The Physical Activity Across the Curriculum (PAAC) study (15) was a large randomized controlled trial, which used surveys to assess teachers' CBPA utilization 9 months postintervention. Results showed that almost all teachers targeted by the intervention were continuing to use CBPA at least once per week, although only 35% of teachers used CBPA daily or on most days (15). Other studies often find lower implementation and maintenance rates among teachers postintervention. For example, Erwin and colleagues (38) used teacher reports to assess CBPA implementation immediately and 3 months after an intervention, finding at both points that only 55% of teachers adhered to the fairly modest recommendation to provide one CBPA opportunity per week. Carlson and colleagues (10) reported that in the semester after pragmatic district-directed CBPA professional development for teachers, teacher surveys indicated that less than 50% of teachers schoolwide had provided any CBPA to their classes during the previous week, despite having been encouraged to offer one 5- to 10-min activity daily. Teacher and administrator surveys were also used by Allison and colleagues (30) to measure compliance after a provincewide CBPA policy change in Ontario, Canada. Administrators reported that about 60% of teachers were complying with the requirement to provide 20 min of moderate to vigorous PA each day during instructional class time; teachers reported slightly lower compliance at 50%.

Other work has used direct observation to measure teachers' use of CBPA, such as to assess fidelity in intervention studies. Observation minimizes the potential for reporting bias (e.g., social desirability bias) that might occur with surveys, or the types of estimating or recall biases that can occur with retrospective reporting during interviews. The System for Observing Movement in Academic Routines and Transitions (SOSMART) (39) has been used in several projects (34) as a tool to assess CBPA. In one study, researchers conducted two or three observations each semester, which were used to create an aggregate score to quantify the extent of CBPA implementation (30). CBPA occurred during 36% of observations in the study's control group, whereas those in the medium and high support group (receiving enhanced implementation support) used CBPA during 49%–50% of observation periods. However, as noted by the researchers (30), two or three observational visits may not provide data that are fully representative of typical classroom practices, and daily measures may be more accurate.

Yet another strategy for assessing implementation outcomes includes the use of "tracking logs" that ask teachers to record frequency, type, and/or duration of CBPA delivered. In previous studies, such logs have been used on a weekly (19,40) or daily basis (38,41). In the PACE project, we used a relatively intensive longitudinal data collection approach to capture implementation outcomes, asking teachers to record CBPA on a daily basis. A weeklong tracking log was provided to each teacher, with space for teachers to record details about each school day; each week's tracking log was collected at the end of that week, for the entire semester-long data collection period. A sample of a 1-wk log is shown in Supplemental Materials, Supplemental Digital Content 1, http://links.lww.com/TJACSM/A45. Teachers who did not return a weekly log were sent a reminder the next week and were asked to return logs even if they did not use CBPA. This approach eliminated missing data, a common concern with logs. The daily reports, with details such as time and duration of each CBPA bout and a brief description of the activity, will allow us to examine not only whether teachers used CBPA but also when they did so, for how long, and what activities they used. In theory, the more temporally proximal the data collection is to the CBPA activity, the more precise the measure of implementation would be, particularly when compared with the accuracy of a single end-of-year survey or interview. This higher frequency of assessment may also reduce response bias. Our data recently collected from 80 teachers over 12 wk yielded more than 4800 teacher-days of data. On average, teachers used 1.2 CBPA activities per day, for an average of 5 min per day. However, there were substantial variations, with some teachers regularly implementing CBPA and others not using it at all. Analyses will use statistical methods to characterize implementation patterns based on these longitudinal data.

With the recognition that approaches for measuring CBPA implementation differ considerably—in terms of documenting, quantifying, and examining changes in teachers' classroom practices over time—we turn next to a consideration of factors that affect teachers' use of CBPA. We also discuss potential

innovations to increase how many teachers within a school provide regular CBPA to their students in the recommended dose. To organize these findings, we use a framework for conceptualizing the implementation of CBPA in classrooms.

Frameworks for Studying the Implementation of Systems and Practice Changes in Schools

For more than two decades, research examining how to promote PA in school settings has demonstrated that interventions are most likely to be effective when they are comprehensive and system-wide, address multiple levels of influence, focus on school climate, and incorporate many key stakeholders (e.g., (42–45)). The field of implementation science has exploded in recent years, in part due to the pressing need to understand not only "whether" interventions work, but also "how" they work. Consideration of the mechanisms that drive complex systems-level changes, such as those occurring in K-12 education systems, can benefit enormously from frameworks that conceptualize factors influencing implementation. Although several projects have examined CBPA implementation, only a few (e.g., (35,46–48)), have explicitly used implementation science frameworks to guide data collection and analysis of how implementation occurs.

A broader systematic review (48) of school PA interventions (not only limited to CBPA) in 2014 identified 22 factors related to program implementation and found that while many of the common factors that affected implementation were represented in often-used implementation frameworks (49,50), some key factors were not. For example, the authors noted that time constraints are one of the most common barriers to PA program implementation, but "time" is not explicitly addressed in many frameworks. However, time can be considered a resource limitation and an indirect influence on many process factors (e.g., planning, goal setting, and evaluating), which are part of many implementation frameworks. Lau and collaborators (51) recently convened a panel of five experts to participate in a modified Delphi consensus process, followed by Bayesian modeling of which factors are most predictive of PA implementation in "youth serving organizations," which included schools and other community settings. That process yielded a final model that included 15 factors, within five groupings: community characteristics, organizational characteristics, provider characteristics, program characteristics, and implementation processes. These five groups overlapped substantially—although not perfectly—with those previously identified in the Consolidated Framework for Implementation Research (CFIR) (49), a meta-theoretical framework that synthesizes the commonalities among dozens of theories, models, and frameworks. Although the CFIR has mainly been used in health services research, its use in education settings is becoming more common.

It is likely that no single implementation framework is comprehensive enough alone to account for all relevant factors driving changes in PA practices. In particular, this may be the case because "PA practices" are not all the same; for example, different factors will influence the implementation of PE courses as compared with those influencing PA breaks—with the former involving staffing, budgets, and decisions often made at a district level and the latter involving factors at the classroom level and the individual characteristics of teachers. We chose to use the five domains identified within the CFIR to organize this review, while also referencing the diagnostic prediction scores (importance rankings) obtained by Lau and colleagues (51) to emphasize the aspects within those five domains that are most relevant to CBPA.

CFIR

As noted above, the CFIR (49) is a meta-theoretical framework. It was first released in 2009, synthesizing the commonalities among previous frameworks, including one that had been widely used in education settings (52). The CFIR identifies 26 constructs within five major domains (see Table 1). The extent that an intervention includes or addresses the various constructs across those domains can inform not only how well an intervention will be implemented but also whether it will be successful, impactful, and sustained. These domains are 1) the characteristics of the intervention, 2) the outer setting, 3) the inner setting, 4) the characteristics of the individuals involved, and 5) the process of implementation.

CBPA Intervention Characteristics: Many Programs but Several Gaps

Within the CFIR, "intervention characteristics" includes eight constructs such as complexity, adaptability, packaging, and cost. With regard to CBPA, many adoption-ready resources are available online (53), including toolkits, programs, and activity packets/cards, in addition to the programs that have been used in randomized controlled trials (12,54). In a review and systematic evaluation of CBPA resources (55), we found over 30 resources that are accessible to school stakeholders through a basic online search (i.e., without the use of a peer-reviewed database). The majority of CBPA resources are free to download, although some have fees associated with training, or to purchase materials. The resources range in their number and type of CBPA activities, including activities of flexible duration and intensity and those that are integrated with learning concepts versus PA breaks. These variations are important for teachers because program adaptability and flexibility—key elements in the CFIR and other implementation frameworks (49–51)—are crucial for meeting the needs of different teachers and their individual classrooms (31–33,51).

Although our review (55) found positive attributes of many programs, there were several factors that programs did not address well. A lack of published evidence of effectiveness was common across the majority of programs. Although most programs focused on teacher skill building, few addressed schoolwide systems changes. In addition, providing advanced implementation support, such as granting access to an individual for purposes of tailoring program training and resources, was only offered by three of the programs (55).

Resources that have been used in research projects often have a narrower range of characteristics and less adaptability than resources designed for use outside of research trials. The majority of large-scale studies have used fee-based resources or have designed their own curricula (19,36,37,54,56,57). Many integrate PA with academic concepts and last about 10 min in duration, and a common recommendation is for teachers to deliver one per day. Although randomized trials have provided strong evidence about the benefits of CBPA for children's PA, because of the rigor and standardization that is necessary in research efficacy trials, these programs may be limited in their transportability for real-world adaptations and may not meet the desires of many teachers to adapt resources to their own preferences.

The PACE project used the *Energizers* curriculum (58); however, the schools in our region also receive enhanced access to GoNoodle® (www.gonoodle.com) because of a paid subscription sponsored by a local healthcare system. Repeatedly, teachers have shared with us that they appreciate the option to select activities that they like, or to develop their own. Although some preferred using video-assisted approaches such as GoNoodle®, others preferred to lead activities themselves using *Energizers*, Take 10!, or other materials. We encourage teachers to use whatever works well for their classroom and meets their personal preferences. PACE was developed based on the Social–Ecological Model (59) to conceptualize various levels of influence on teacher behaviors, and we used Self-Determination Theory to guide our exploration of individual-level characteristics that motivate teachers' actions.

TABLE 1.
Topics and Constructs in the CFIR.

Intervention characteristics
Source of intervention, whether internal or external
Strength and quality of evidence for the intervention to produce outcomes
Relative advantage over other interventions
Adaptability
Trialability and the ability to pilot test the intervention
Complexity
Quality of design and packaging of the intervention
Cost
Outer setting
Priority on meeting student/teacher needs that are addressed by the intervention
Degree of networking with other external partners
Peer pressure to implement
Policy and incentives at government or societal level
Inner setting
Structural characteristics of organization such as size and age
Nature and quality of networks and communication channels
Organizational culture such as norms and values
Implementation climate (need for change, compatibility, relative priority, organizational rewards, goals and feedback, learning climate)
Organizational readiness to implement (leadership engagement, resources, access to information)
Characteristics of individuals
Knowledge and beliefs about the intervention
Self-efficacy
Stage of change
Individual identification with the organization
Other personal attributes such as motivation, capacity, competence
Process
Planning
Engaging with leaders (opinion leaders, internal appointed leaders, external agents, champions)
Executing
Reflecting

Table adapted from File 3 of Damschroder et al. ((49)).

Self-Determination Theory is the culmination of decades of work by Deci and Ryan (60) examining how intrinsic and extrinsic motivation drives human behavior. This theory emphasizes that for behavior to be sustained, it must allow individuals to feel competent (similar to self-efficacy) and autonomous, and provide a sense of relatedness (i.e., being part of a community). Indeed, we—and others—find that autonomy is important, allowing teachers to choose whether, when, where, and how to implement CBPA (40, 49,61–63).

Context is Crucial

The second and third domains of the CFIR pertain to the outer and the inner setting. Similar to the widely used Social–Ecological Model (59), which has a parsimonious ability to conceptualize how the social environment shapes individual behaviors, the CFIR's inner and outer setting domains include powerful environmental drivers of behavior such as norms, policies, culture, and climate. As applied to schools, the outer setting pertains to community- and district-level policies and expectations about professional practices. The inner setting pertains to school-level and classroom characteristics such as school culture, capacity for change, collaborative norms among teachers, channels for communication and professional development, climate, leadership engagement, and availability of resources.

Carlson and colleagues (47) used the CFIR to guide the development of survey items that were subsequently used to predict CBPA implementation. Key predictors of changes in CBPA practices at schools included contextual factors such as organizational climate, specifically teachers' perceptions of school norms and administrator support for CBPA. Consistently, research has shown that successful school innovations depend on the school climate (64). Lack of administrative support, or a school climate that is not supportive of PA, hinders the implementation of new practices (65). In the importance rankings identified by Lau et al. (51) to explain PA implementation, leadership support was ranked first in importance. Although it is clear that school climate matters, there are still questions about how to change it and how school leadership can be mobilized to change the school climate to support CBPA.

Principal Leadership

In our interviews with teachers, we have solicited suggestions about how administrators can help teachers while they work through the process of CBPA implementation (61). Most of the themes emerging from interviews pertain to how administrators can empower teachers to implement CBPA. Specifically, the need for explicit messages of approval was common. Teachers expressed concern over having their rooms in "chaos" from students moving about when administrators drop by. Administrators could assuage these fears by giving positive encouragement for using CBPA during visits and formal evaluations, which are often routine in elementary schools. For example, one teacher described how, during a routine observation of instructional practices, the principal had explicitly noted that the use of an activity break reflected that the teacher was monitoring her students' needs and responding with a positive and effective strategy to help them get back on task (61). Teachers consistently report that encouragement from school leaders helps them to feel empowered to explore ways to implement CBPA that work for their students, and with their own preferences for daily scheduling (61).

Teacher Characteristics Are a Crucial Determinant of Whether CBPA Gets Used

The fourth CFIR domain, characteristics of individuals, considers the dynamic relationship between individuals and the systems in which they work and the ways that knowledge, attitudes,

self-efficacy, and motivation of individuals (i.e., teachers) can affect implementation. Teacher characteristics were identified in the study of implementation drivers by Lau and colleagues (51), such as belief and motivation, as well as teacher knowledge and skills.

Teacher Beliefs about CBPA

Much of what is known about teachers' beliefs and attitudes about CBPA—and their perceptions about the outcomes of CBPA—has been derived from mixed-methods approaches, with some studies using surveys and others using interviews. Interviews with teachers reveal a variety of perceived benefits to CBPA, with the most common being increased student ability to focus, student enjoyment, and improved classroom community and camaraderie (31–33, 66–68). However, teachers also identify barriers or drawbacks to implementing CBPA. Although a primary concern among teachers is that CBPA takes time away from learning academic content, other common themes include barriers such as not having sufficient time or resources to plan and prepare CBPA activities, difficulty getting students "back on track" after CBPA, and a lack of confidence in their own ability to implement CBPA (31–33,66–68).

In one of the first CBPA studies to assess theoretically derived teacher characteristics such as confidence (also known as self-efficacy), Bartholomew and Jowers (69) found that subsequent CBPA implementation was negatively associated with perceived barriers such as lack of time ($r = -0.58$), and that perceived barriers were strongly negatively associated with lower self-efficacy ($r = -0.84$). Implementation was associated with higher self-efficacy ($r = 0.47$). In other words, teachers who lacked confidence perceived more barriers to implementation and were also far less likely to implement CBPA. Similar results were obtained in a quantitative study among 213 elementary school classroom teachers, using teachers' perceptions of CBPA to predict their subsequent implementation (70). Structural equation modeling showed that teachers' personal PA habits predicted their perceived competence for using CBPA, and competence was the strongest predictor of CBPA implementation (70). In a recent study of Canadian teachers' use of CBPA subsequent to a provincial policy change, several classroom-level predictors of teachers' practices were identified, including perceptions that providing daily CBPA is feasible and teachers' confidence/self-efficacy (46). As with interview studies (31–33), logistical issues such as scheduling, time, and classroom space were also related to teacher practices (46).

In our work on the PACE project, we have found that most elementary classroom teachers strongly agree that CBPA has benefits for student time on task and test scores and improves the classroom environment (71). However, those beliefs are not necessarily predictive of the extent/frequency of their implementation of CBPA, whereas logistical issues such as CBPA being perceived to be a hassle to implement, and not being compatible with the teacher's educational philosophy, are predictive of subsequently low implementation (71). We did not find self-efficacy to be associated with implementation (71) but believe that to be due to a ceiling effect; after leading professional development sessions with nearly 200 teachers at 10 elementary schools, our survey data indicated that the majority (89%) felt confident in their ability to lead activity breaks. As noted previously, autonomy is a central element of Self-Determination Theory, and teachers feel more comfortable taking action if they can choose what to do, and how and when to do it (61,62).

How Does It Happen? The Process of Implementation

The fifth domain in the CFIR—process—considers four activities that are part of most models of change: planning, engaging, executing, and evaluating. This is often an iterative process that involves testing and modifying efforts to engage in new behaviors. In the case of CBPA, we have seen in the PACE project that teachers often go through all phases relatively quickly, sometimes even during the course of a professional development workshop. For example, after the part of a workshop where we share information with teachers that is designed to increase knowledge and change attitudes to be more positive about CBPA (i.e., the "why" of behavior change), we also provide opportunities for practice that allow teachers to become familiar with the "how" of this new practice by asking them each to lead a brief activity break in small groups. By structuring professional development activities with several meetings over a few weeks, teachers leave the first session with a plan for implementation, which they execute over the next few days or weeks, and then at a subsequent meeting they will evaluate, trouble-shoot, and circle through the process. Over time, repeated experiences with attempts at using CBPA has the potential to build teachers' confidence and skill in making this a routine part of their classroom practice.

As noted in our CBPA program review (55), the evaluation and monitoring of schoolwide CBPA is rarely addressed in existing curricular and program resources. Moore and colleagues (35) used an iterative feedback approach during a comprehensive school PA program, which aimed to increase CBPA delivery rates among teachers. This included feedback given to teachers by research personnel after direct observations, as well as an open dialogue among research staff, school staff, and administrators. Such an evidence-based approach, which allows for tailoring of feedback to teachers who may be struggling, as well as providing positive feedback/reinforcement, has promise for application within school-based interventions.

Interventions to Change Instructional Practices in Schools

Lastly, we review the emerging evidence about interventions to support teachers' CBPA implementation, particularly delivery rates and sustainability, as important proximal outcomes. In other words, CBPA implementation is important as not only an intervention fidelity measure and a mediator of benefits for students—if teachers do not implement CBPA, then schoolwide interventions or policy changes are unlikely to be effective in changing outcomes at the student level—but also as an outcome of its own accord (i.e., implementation outcome).

Professional Development: Dose, Duration, and Delivery Matters

As with any intervention to change behavioral outcomes—in this case, the outcome being teachers' CBPA practices—a key question pertains to how much exposure is necessary to promote and sustain change. A comprehensive review of rigorous research on teacher development concluded that one-time workshops are not effective for improving teacher practices or student learning (72), whereas programs that offer from 30 to 100 contact hours of training (49 h on average), over 6 to 12 months, show a positive and significant effect on student achievement (73). Although implementing CBPA is far more specific—and perhaps simpler—than implementing the instructional changes required by a new mathematics or reading curriculum, it is reasonable to expect that sustained support is also necessary to change teachers' CBPA practices. Many elementary teachers have not received training in PA and do not feel comfortable implementing CBPA (28,40). A process evaluation of PAAC revealed that a lack of familiarity with such programming and inadequate training were barriers to implementation, with teachers requesting additional demonstration of lessons (40). Considering that substantial and ongoing training is necessary for changing teacher practices, a consequent implication is that the modest levels of implementation seen previously in CBPA interventions may be a result of relatively brief interventions that lack ongoing implementation support.

On the PACE project, we are exploring the feasibility and effectiveness of approaches to increase the dose and duration of teacher support. To increase the likelihood of real-world scale-up, which often must occur without additional funding or outside technical assistance, we have focused on support mechanisms that offer the ability to provide sustained resources and coaching for teachers, with the following considerations: (a) approaches must leverage existing resources and social capital within each school (i.e., not requiring outside content expertise), (b) respect for teachers' autonomy must be prioritized, and (c) the importance of the entire school context is considered. In the following sections, we describe two approaches we are testing.

Building a Community to Support CBPA: Professional Learning Communities and Communities of Practice

Community can be a powerful force for effecting change. Process evaluation of the large-scale PAAC intervention (40) revealed that teachers were interested in having a forum for sharing ideas with other teachers. This is consistent with educational strategies such as using a professional learning community (PLC) to facilitate teacher development (74), but thus far these approaches have not been widely incorporated into CBPA interventions or implementation supports. Through regular meetings, a PLC engages participants in the following activities: (a) identifying a specific area of instructional effectiveness, (b) developing plans to implement the technique, (c) analyzing results of implementation, and (d) discussing challenges associated with implementation. As noted previously, the CFIR process domain emphasizes the importance of planning, testing, evaluating, and modifying in an iterative cycle. A PLC may provide the place for teachers to test and adapt strategies to implement CBPA.

The PLC framework has similarities to the "community of practice" (CoP) approach (75), which emphasizes the importance of learning as a social process, whereby individuals co-construct shared group norms of practice. The development of a professional community that is supportive of PA can facilitate the "relatedness" that is emphasized in Self-Determination Theory (60), whereby connectedness with other professionals may enhance professional practice. CoP approaches are being tested for their benefits in supporting classroom teachers in implementing CBPA (28,76–78), and as noted by other work in this special issue, teachers value such communities for collaboration and increasing their feelings of agency (78). Preliminary evidence (34) after a yearlong intervention with 12 teachers/classrooms suggested that a CoP alone did not increase teachers' use of CBPA, but there was evidence of an effect when multiple intervention components based on the partnership model of Webster and colleagues (28) were combined, including an online CoP, community-based participatory research, and service learning.

Through semistructured interviews with 35 teachers at two elementary schools, the PACE project explored teachers' attitudes about hypothetical strategies to support implementation, such as "to what extent might collaboration time be used at schools for teachers to share strategies among themselves?" (61). Teacher responses were mixed. Some agreed that it could be appropriate because they perceive their peers to be credible sources of information about what works and what does not, but their formal collaboration time was already so busy that it might not be practical. This was also noted by Webster and colleagues (30) in their trial of a CoP, with positive feedback from teachers, but many reporting that time is too limited to join a CoP. We have found that variations in the dynamics of grade-level teams are important (61). Some teams were particularly collaborative and supportive of one another, and often those were the teachers who indicated that they would value the sharing of strategies among their team; by contrast, less-cohesive teams were not eager to use collaboration time for this purpose.

Physical Activity Leaders and Social Capital

Another intervention that PACE has explored is whether the PE teacher might act as a resource or a coach for classroom teachers implementing CBPA (79). This parallels recommendations by national organizations such as SHAPE America (80) and PE teacher education training programs at universities (81) to enhance leadership opportunities for PE teachers and to ensure that they have adequate preparation to take on leadership roles. Specifically, we were interested in exploring whether PE teachers could provide "embedded coaching," which is often used by school leaders and district- or school-level instructional coaches to support teachers' implementation of other educational changes such as new mathematics standards or a new reading curriculum. Elevating the PE teacher to a coaching/leadership role similar to that held by an instructional coach could offer the advantage of sustained contact (vs a one-time professional development session) provided by an individual who understands the local context (the "inner setting"). In terms of the CFIR framework, considerations related to the implementation process pertain to whether the PE teacher would be appropriate as a "formal internal implementation leader" or "champion." Program champions require expertise, credibility, access, and engagement (49). With regard to the credibility of the PE teacher, in our interviews with 35 classroom teachers, some indicated that they would value support from a PE teacher (61). One said that would be "really powerful because she has all that background knowledge." The notion of a PE teacher providing support and modeling of CBPA resonated with teachers who were familiar with job-embedded professional development. However, in this work, we—like others before us (82)—found that not all PE teachers have the time to take on leadership roles, nor necessarily the desire or the ability to do so.

For such an approach to work, it is also necessary for the PE teacher to have sufficient social capital to lead change. Implementation frameworks note that a single individual or group of individuals who enthusiastically support a cause can drive organizational change (49). However, those individuals must have the social capital to champion changes (83). Social capital involves the establishment of trust, strong communication channels, and norms that promote cohesiveness (83,84). Promoting collaboration among teachers can help to change perceived norms and to build social capital. In our work examining how PE teachers can promote CBPA, we have found that social capital is essential (78); in particular, positive norms about PA and collaborating to support the well-being of students are crucial characteristics of schools where PE teachers have established comprehensive PA programs, including CBPA.

CONCLUSION

Although a majority of teachers seem to recognize the value of CBPA for their students, they must constantly prioritize numerous demands on their planning time and classroom time. It can seem daunting for district leaders or coaches to motivate teachers to adopt yet another new practice, particularly when working in a system unsupportive of CBPA. However, the importance of providing students with regular and frequent opportunities for brief bursts of PA during the school day cannot be overstated in today's society where many opportunities for PA have come to be viewed as optional rather than essential. The evidence is clear for the positive effects of CBPA, including the behavioral and academic benefits that motivate teachers and parents. Thus, policies at the state, district,

and/or school levels are justifiable for health and academic reasons, and CBPA should be considered an evidence-based best practice.

Ongoing CBPA implementation efforts should address the multitude of barriers that exist at organizational and individual levels, such as providing practical solutions to assist with scheduling and time-management, as well as transparent goal setting and feedback mechanisms. Principal leadership and a supportive school climate are crucial for empowering teachers to experiment with implementation and to ensure they have the autonomy to adapt CBPA curricula in ways that suit their instructional and classroom management practices. PA leaders or instructional coaches can provide ongoing support to sustain implementation through problem solving to resolve logistical issues such as time, space, and scheduling. Professional development mechanisms can be structured to allow teachers the chance to work through an iterative process of implementation, with extended feedback and support from leaders and peers at each school.

The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through grant R305A150277 to the Boise State University. The opinions expressed are those of the authors and do not represent views of the institute or the U.S. Department of Education.

The authors thank their coinvestigators and collaborators on the PACE project, Michele Carney, Julianne Wenner, Tyler Johnson, Brian Flay, Matt Mahar, and Rhonda Heggen. They also thank the students, teachers, principals, and district leaders who partnered with them on their work to explore classroom-based physical activity over the past 4 yr.

The authors do not have professional relationships with companies or manufacturers who will benefit from the results of the present study. This manuscript does not constitute endorsement by the American College of Sports Medicine.

This review article includes presentation of some original research results, which were gathered with the review and approval of the Institutional Review Board at Boise State University, and informed consent from teachers.

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