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PHYSICAL ACTIVITY

Adoption of Comprehensive School Physical Activity Programs: A Literature Review

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Abstract

Recent research has provided preliminary insight into the implementation of Comprehensive School Physical Activity Program (CSPAP) components in P–12 schools, but additional empirical support is needed to establish the CSPAP model as a viable conceptual framework. The purpose of this review is to examine the extent to which the CSPAP framework is currently being adopted and implemented in schools, by each CSPAP component and holistically as a model. Specifically, the review consists of three thematic areas: (a) CSPAP single and multicomponent outcomes based on empirical studies, (b) barriers and facilitators associated with CSPAP adoption, and (c) suggestions for future research and methodological considerations aimed at advancing CSPAP adoption. The information provided in this review expands the knowledge base, which is necessary to transform CSPAP theory into an adoptable and sustainable model for schools.

P–12 physical education (PE) has evolved significantly over the last several decades, with one of the most important changes occurring recently with the inclusion of PE as a core academic subject (Society of Health and Physical Educators [SHAPE America], 2015c). Well-designed PE programs have been acknowledged as having the unique potential to address student learning in all three of Bloom's domains (psychomotor, cognitive, and affective; National

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Association for Sport and Physical Education [NASPE], 2011; SHAPE America, 2015a), but PE did not become a validated core subject until the recent 2015 revision of the federally legislated Elementary and Secondary Education Act (ESEA), a designation long since desired in the field (SHAPE America, 2015c).

The advancement of a holistic approach emphasizing the education and health of students began in the late 1980s with the promotion of the Coordinated School Health Program model by the Centers for Disease Control and Prevention (CDC). The model identifies schools as essential agencies of change in youth health behaviors (Wechsler, McKenna, Lee, & Dietz, 2004) and includes eight components known to strongly influence student health, with PE serving as one of the components (Allensworth & Kolbe, 1987). In 1991, Sallis and McKenzie published the seminal paper "Physical Education's Role in Public Health," highlighting the vital potential contribution of schools and PE in addressing the nationwide concerns related to childhood obesity and physical inactivity.

In response to this critical national concern, the U.S. Department of Health and Human Services (USDHHS, 2008) introduced the first set of approved guidelines addressing physical activity (PA): the *2008 Physical Activity Guidelines for Americans.* The guidelines recommend that children and adolescents engage in at least 60 min of moderate to vigorous physical activity (MVPA) daily. To further convey the importance of increasing PA opportunities, NASPE (2008) released a position statement recommending that all P–12 schools implement a Comprehensive School Physical Activity Program (CSPAP). A CSPAP should include (a) quality PE (QPE), (b) PA during school, (c) PA before and after school, (d) school employee wellness and involvement, and (e) family and community involvement.

The *National Physical Activity Plan* (NPAP Alliance, 2010) includes comprehensive strategies to promote PA by eight sectors of society. The education sector is responsible for outlining strategies and tactics that could be implemented in and around the school setting (NPAP, 2010), with the first of seven strategies specifically targeting the comprehensive approach of the CSPAP. The goal of Strategy 1 is to "provide access to and opportunities for high-quality, comprehensive physical activity programs, anchored by physical education, in Pre-kindergarten through grade 12 educational settings" (Education

section, para. 4). In line with this strategy and the NASPE (2008) recommendation, schools have been identified as one of the most appropriate settings for increasing PA (Institute of Medicine [IOM], 2013; Kelder, Karp, Scruggs, & Brown, 2014; NPAP Alliance, 2010; USDHHS, 2008), and national initiatives such as Let's Move! Active Schools (n.d.) have been established to provide schools and teachers with the necessary resources and tools to increase PA opportunities for students.

Most recently, in *The Essential Components of Physical Education,* SHAPE America (2015a) outlines four components that establish a more direct path for attaining QPE programs: (a) policy and environment, (b) curriculum, (c) appropriate instruction, and (d) student assessment. SHAPE America (2015a) identifies these as foundational components designed to guide schools and physical educators in making PE a more validated subject area. In addition to emphasizing more rigorous policies and higher accountability in the field, SHAPE America (2015a) also strongly endorses the use of the CSPAP framework to increase overall PA opportunities for students.

Efforts to align PE with public health goals have increased since the original Sallis and McKenzie (1991) article, but in a 20-year follow-up, Sallis et al. (2012) suggest that more work is needed to reach widespread adoption of public health goals. Recent research has provided preliminary insight into the implementation of CSPAP components in schools (Erwin, Beighle, Carson, & Castelli, 2013), but additional research is needed to further examine the effect of each CSPAP component on PA outcomes (Carson, Castelli, Beighle, & Erwin, 2014) and to collect empirical support for the CSPAP model as a viable conceptual framework.

Purpose

The purpose of this review is to examine the extent to which the CSPAP framework is currently being adopted and implemented in P–12 schools, by each CSPAP component and holistically as a model. Specifically, the review consists of the following thematic areas: (a) CSPAP single and multicomponent outcomes based on empirical studies, (b) barriers and facilitators associated with CSPAP adoption, and (c) suggestions for future research and methodological considerations aimed at advancing CSPAP adoption in P–12 schools. Although the findings are not exhaustive, the information

provided in this review expands knowledge base, which is necessary to transform CSPAP theory into an adoptable and sustainable model for schools.

Inclusion Criteria

The literature search for this review included refereed journal articles (research and topical), electronic reports, position statements, and books published between 1991 and 2015 and consisted of electronic search databases such as Sport Discus, PsycInfo, Academic Search Complete, and ERIC. Secondary searches within references of cited review articles and manual searches of selected journals and special issues in the field of PE were also included. Excluded from the review were nonrefereed articles, dissertations, abstracts, conference proceedings, and articles published outside of the United States.

The 1991 seminal article "Physical Education's Role in Public Health" (Sallis & McKenzie, 1991) provided the starting point for this review of CSPAP adoption in schools, but empirical articles and reports were reviewed only if the following criteria were met: (a) they were published after NASPE's (2008) CSPAP position statement, (b) the CSPAP model was established as the guiding conceptual framework, and (c) they were related to CSPAP outcomes and implementation. This served to distinguish empirically based studies guided by the CSPAP framework from school-based PA interventions supported by a different theoretical framework and from empirical studies that indirectly addressed a single component or multiple components of a CSPAP. If the intervention or study was not designed or situated within the context of a CSPAP, it was excluded from this review. The first section of the review includes reported outcomes linked to each CSPAP component and outcomes related to implementing multicomponent CSPAPs.

Comprehensive School Physical Activity Program Outcomes

The goal of a CSPAP is to provide a variety of school-based activities and PA opportunities that will enable students to meet the daily recommendation of 60 min of MVPA (NASPE, 2008; SHAPE America, 2015a). The CSPAP framework comprises five synergistic components: (a) QPE, (b) PA during school, (c) PA before and after school, (d) staff involvement, and (e) family and community engage-

ment (CDC, 2013; SHAPE America, 2015a). The examination of each CSPAP component and how effectively it is being implemented in schools is necessary to determine the degree to which it can contribute to PA outcomes (Carson, Castelli, Beighle, & Erwin, 2014).

Quality Physical Education

QPE has been termed the cornerstone of the CSPAP model and provides the foundational base for comprehensive school efforts that aim to increase students' PA (Rink, Hall, & Williams, 2010). Standards-based QPE (SHAPE America, 2015a) is the only PA opportunity within the CSPAP framework that includes specific learning outcomes in a formalized instructional setting (Chen, Hypnar, Mason, Zalmout, & Hammond-Benett, 2014). The minimum recommendations include 150 min/week of PE at the elementary level, and 225 min/week of PE for middle and high school students (IOM, 2013; SHAPE America, 2015a).

To date, only Chen et al. (2014) has explicitly examined the effect of QPE on CSPAP-related outcomes. In a 2-year study, Chen et al. examined the contribution of QPE teaching practices (QPET) in promoting daily PA behaviors of students in and outside of school. The Assessing Quality Teaching Rubric was used to examine the effect of four essential teaching dimensions (task design, task presentation, class management, and instructional response) on nine elementary PE teachers, and a 7-day self-report PA log was used to measure students' daily PA. Chen et al. concluded that QPET and the essential teaching dimensions significantly contributed to students' daily PA in school (PE and recess), more so than to their daily PA outside of school.

QPE is known to be an integral component in creating more opportunities for PA in the school day (Sallis et al., 2012) and can contribute to students' daily PA levels in a short time (Erwin et al., 2013). However, as evidenced by the repeated call for multicomponent approaches, QPE should serve as the foundation in the efforts toward reducing child and adolescent obesity, but cannot act in isolation if substantial progress is to be made (IOM, 2013).

Physical Activity During School

According to the CSPAP Policy Continuum (CDC, 2012), PA during school can include classroom activity breaks, recess, and

drop-ins (more common in secondary schools; Erwin et al., 2013). In one study of PA during school, Goh et al. (2014) used the Take 10! program as part of a 12-week intervention designed to increase elementary students' in-school step counts and PA intensity levels. The elementary teachers were trained to implement the Take 10! program, which consists of 10-min classroom-based physical activities integrated into age-appropriate academic content and learning objectives (Goh et al., 2014). Outcomes measures in this study included (a) students' daily PA levels/step counts (measured with pedometers), (b) students' PA intensity (measured with accelerometers), and (c) teacher fidelity (measured with responses to weekly questionnaires).

The findings included a significant increase in the students' average time spent in vigorous intensity PA from baseline to end-intervention, as well as a statistically significant increase in students' daily in-school step counts at 8 weeks (mid-intervention) as compared with baseline. Based on questionnaire data, Goh et al. (2014) noted that the teachers conducted an average of one Take 10! activity per school day during the intervention (a range of one to three times per day). Students' average time spent in MVPA increased significantly from baseline to end-intervention, representing a nominal increase of approximately 2 min in MVPA (Goh et al., 2014).

Erwin, Beighle, Morgan, and Noland (2011) also conducted a classroom-based PA intervention involving 16 elementary school teachers. The intervention was designed to be low cost and easy to use, with only brief trainings for the teachers. The study included two schools (one intervention and one control). The teachers from the intervention school attended two 30-min classroom PA trainings (by experts in the area of classroom-based PA) and were provided with inexpensive curricular resources (activity break cards). Outcome measures in the study included students' mean school steps per day measured with pedometers and frequency of classroom activity breaks self-reported in teacher logs. The students wore pedometers up to 12 days, and data were collected for three monitoring periods over the course of 1 school year. The compliant teachers reported an average of one activity break or more per day, which was significantly higher than the reported breaks by noncompliant

teachers. The intervention compliance group (i.e., students in class in which the teacher included at least one activity break per day) accrued more school steps per day at the follow-up monitoring period. Three months later at post-follow-up, the compliance group again averaged significantly more school steps per day than did control groups (Erwin et al., 2011).

Studies such as the two described provide valuable insight on the efficacy of classroom-based interventions and the ability to increase students' classroom and daily PA levels through the addition of one PA break per day (Erwin et al., 2013; Erwin et al., 2011; Goh et al., 2014). In two additional studies, researchers investigated classroom-based PA with an emphasis on teacher-level outcomes and perceptions related to the implementation of PA breaks.

As part of a larger 5-year school health study, McMullen, Kulinna, and Cothran (2014) explored elementary and high school classroom teachers' perceptions of using PA breaks. Participating teachers attended 10 professional development workshops each year, had access to mentoring, and were provided grade-level activity break resources. Data were collected from semistructured interviews and teacher reflective journals. Data were analyzed inductively, and three themes were identified that related to key characteristics the teachers considered when selecting activity breaks: threats to classroom control (e.g., chaos during activity, space constraints, and challenge of students getting back on task), a preference for breaks with connections to academic content, and the importance of implementation ease and student enjoyment of activities (McMullen, Kulinna, & Cothran, 2014).

In a second study, Webster et al. (2013) investigated elementary classroom teachers (ECTs) and the relationships between the ECTs' awareness of a statewide policy (the South Carolina Student Health and Fitness Act of 2005), perceived school support for PA promotion in the academic classroom (PAPAC), perceived attributes of PAPAC, domain-specific innovativeness, and self-reported PAPAC. The diffusion of innovations theory and a social ecological perspective served as the theoretical frameworks for investigating possible predictors of ECTs' adoption of PAPAC. Results indicated that the ECTs' awareness of the statewide policy predicted perceived school support. This in turn predicted perceived attributes (attributes, which if perceived

can contribute to the adoption of an innovation) and domain-specific innovativeness (ECTs' level of educational innovativeness or receptiveness to new policy can be a predictor of adoption). Perceived compatibility, simplicity, observability, and domain-specific innovativeness were reported to predict self-reported PAPAC (Webster et al., 2013). This study demonstrates a successful application of two complementary theories, which proved to be useful in the investigation of influential variables related to the adoption of PAPAC.

Recess is another viable strategy for increasing PA opportunities during the school day (CDC, 2013; SHAPE America, 2015a). According to the American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD, 2011) CSPAP survey report, scheduled recess is provided in over 80% of elementary schools, with 31% of those schools having a policy or practice that prevents recess from being withheld (as a form of punishment or behavioral consequence). Results of the survey also indicated that 76% of the elementary schools provide recess 5 days/week, with 65% of the schools allocating 15–29 min for each recess period. The percentage of schools that provide recess decreases through middle school and even more so in high school, with only 10–11% of schools providing recess (AAHPERD, 2011).

Only one empirical study situated within the CSPAP framework was found to examine the effect of recess on PA outcomes in students. Erwin et al. (2012) used pedometers to determine the contribution of unstructured 15-min outdoor recess periods on school-day PA levels of students from two public elementary schools. A secondary purpose in the study was to determine if recess and school-day PA levels varied by BMI, gender, and grade level. Third, fourth, and fifth graders from the schools wore pedometers for 4 consecutive days and were prompted to record step counts prior to recess, after recess, and at the end of the school day. Pedometer step counts were averaged across the days that the students wore the device.

Results indicated a significant main effect for grade level on the percentage of step counts during recess, with students in fourth grade accumulating a greater percentage than did students in third and fifth grade. There was no significant main effect for BMI or gender on the percentage of steps accumulated during recess. Although boys accumulated a higher school-day step count, there were no gen-

der differences in activity level during recess. School recess supervisors should encourage semistructured and unstructured options and provide a variety of equipment to keep students physically active and engaged (Erwin et al., 2012).

Physical Activity Before and After School

The CSPAP Policy Continuum breaks down the PA before- and after-school component into the following categories: (a) extracurricular sports, clubs, and activities; (b) active transport to school; (c) access to school grounds/facilities; (d) before- and after-school programs; and (e) interscholastic sports (CDC, 2012). Results from AAHPERD's (2011) CSPAP survey indicate that almost two thirds of schools (63%) offer PA clubs and/or intramural sports.

At the time of this review, no empirically supported literature on before- or after-school programming (contextualized within the CSPAP model) could be identified. The effectiveness of after-school PA interventions could be better understood with additional research including school-level randomization, extensive assessments, and follow-up studies (Beets, Beighle, Erwin, & Huberty, 2009). Many of the findings related to after-school interventions lack detailed descriptions of the intervention, contain inconsistent methodologies, and are missing relevant information on program design (Beighle et al., 2010).

Staff Involvement in Physical Activity

When involved in the overall PA mission of the school, staff members not only improve their personal health by being active and reducing job-related stress, but also serve as positive role models for students. According to the 2011 CSPAP survey, involvement for staff entails staff members serving as positive role models for students by having a physically active lifestyle and supporting participation in PA before, during, and after school. Additionally, strong staff involvement often occurs in districts or schools that provide (or subsidize) PA and employee wellness programming for the staff and in districts or schools that aim to create an environment that values and supports PA for students and staff (AAHPERD, 2011).

PA classes were offered in 42% of schools, but in the majority of them less than half of the staff members participated in the activities. To date, no empirical studies have been found that directly examine

staff involvement as a component of a CSPAP, and thus, the contribution to overall student PA outcomes is still unknown (Erwin, Beets, Centeio, & Morrow, 2014).

Family and Community Engagement for Promoting Physical Activity

What students see and do at home is a major factor in influencing behaviors (Centeio, Somers, et al., 2014; Rink et al., 2010), and opportunities to engage in PA should not stop when students leave school (Cipriani, Richardson, & Roberts, 2012). However, even with the recognized effect on youth behaviors, the family/community engagement component is the least implemented in the CSPAP model (Cipriani et al., 2012), leading to a paucity of research in this area (Cipriani et al., 2012; Erwin et al., 2014). As with the staff involvement component, no empirical studies that examined the effect of family and community engagement on PA outcomes were identified within the literature search. The majority of research in this area includes PA interventions based on multicomponent approaches similar to the CSPAP model. Although not included in this review, the intervention studies that included family and community involvement as part of the multicomponent approach have shown greater increases in overall PA levels of children (Cipriani et al., 2012).

The Physical Activity Leader (PAL; SHAPE America, 2015b) has a central role in facilitating more involvement from family and community members. Strategies to promote increased family and community engagement include (a) increasing communication (e.g., newsletters and websites) regarding PE/PA events and opportunities that support family PA, (b) establishing partnerships and sharing expertise with the surrounding community, and (c) sharing facilities with community members (Cipriani et al., 2012).

Multicomponent Comprehensive School Physical Activity Programs

To date, there is a nominal amount of empirical evidence related to the implementation and outcomes of a full five-component CSPAP. This lack of research corresponds to the limited number of five-component CSPAPs that are reported in schools. The 2011 CSPAP survey results indicate that less than one sixth of schools (16% of elementary schools, 13% of middle schools, and 6% of

high schools) provide a CSPAP that consists of all five components (AAHPERD, 2011). The following section will highlight the empirical studies based on multicomponent CSPAPs. To delineate between the varying levels of component implementation, we categorized the studies by the number of components that they include beyond the foundation of QPE (i.e., QPE + 1, QPE + 2, QPE + 3, and QPE + 4).

In a quasi-experimental study, Burns, Brusseau, and Hannon (2015) examined the effect of a CSPAP intervention on school-day step counts of fourth and fifth grade students. The intervention was primarily focused on PE and consisted of teacher trainings and assistance to improve PA and health outcomes. Teachers taught lessons based on an elementary-level curriculum and set goals to have students active for at least 50% of class time. The CSPAP intervention also addressed two areas within the PA-during-school component: recess (e.g., activity stations and semistructured activities) and classroom activity breaks (two or three 5-min breaks were encouraged), designating it as a QPE + 1 study (based on authors' CSPAP implementation categories). Results indicated statistically significant main effects for gender and time, with boys, on average, displaying greater step counts than girls, and a higher average for both boys and girls in daily step counts postintervention as compared to preintervention measures. Overall, the CSPAP intervention increased overall daily step counts and also attenuated the decrease in student daily step counts over the course of a school week (Burns et al., 2015).

Deslatte and Carson (2014) utilized a mixed methods design to identify common characteristics of CSPAPs and strategies for implementing the CSPAP model. The study included two elementary schools and one middle school. Four participants represented each school in the study: a PE teacher (who had implemented at least one other CSPAP component besides PE), two classroom teachers, and an administrator (who was identified by the PE teacher as a supporter of CSPAP). Data collection from the PE teachers included the national CSPAP survey (AAHPERD, 2011), an e-mailed question set, and informal observations. Data were also collected from the classroom teachers and principals through individual interviews. The authors concluded that the role of the PE teacher was "integral to implementing a CSPAP" (Deslatte & Carson, 2014, p. 611), but it was also important for the teacher to seek additional support from

key stakeholders (administrators and classroom teachers) to help facilitate successful CSPAP implementation (Deslatte & Carson, 2014).

In a different study, Centeio, Somers, et al. (2014) examined the effect of an 8-month CSPAP (QPE+4) on the PA outcomes of students, parents, and educators. Specifically, the study addressed PA opportunities in the areas of (a) QPE, (b) classroom PA (including classroom time and specials), (c) lunch and recess, and (d) after-school PA clubs. The study was guided by the social ecological framework (Sallis, Owen, & Fisher, 2008), which addresses the multiple factors and levels of influence on health behaviors, and reciprocal determinism, which suggests that changes within one intervention level can lead to changes in other levels. The authors investigated the effect of simultaneously implemented CSPAP components and the potential for bidirectional influences within the CSPAP system. Six schools participating in the Building Healthy Communities program (whole-school approach focused on PA and nutritional programming) were randomly selected for the study (Centeio, Somers, et al., 2014b).

PA outcome measures included student in-school PA (pre/post) using accelerometers and self-reported PA by parents and educators using the short version of the International Physical Activity Questionnaire (IPAQ). Results indicated a significant difference (increase) in total MVPA minutes. Overall, significant increases were found in time spent in MVPA in PE, at lunch/recess, and in the classroom. A significant overall change in reported metabolic equivalent minutes per week (based on IPAQ scoring system) of parent PA was also found. Results indicated a change in the PA of the educators, but it was not statistically significant, a finding possibly related to small sample size (Centeio, Somers, et al., 2014b).

A 2-year pilot CSPAP study (QPE + 4) was recently completed in an urban middle school in Georgia, in which the researchers conducted an in-depth analysis of the design, implementation, feasibility, and efficacy in achieving a series of outcomes (Metzler, Barrett-Williams, Hunt, Marquis, & Trent, 2015). The CSPAP was based on the Health Optimizing Physical Education (HOPE) curriculum model. The model comprises eight strands, each of which is aligned with the overarching goal of HOPE and the components of a CSPAP: before/during/after-school PA programming; sport, games, dance, and other movement forms; family/home education;

community-based PA programming; health-related fitness; diet and nutrition for PA; PA literacy (consumerism, technology, advocacy); and integration of HOPE across all school subjects (Metzler, McKenzie, van der Mars, Barrett-Williams, & Ellis, 2013).

Pre- and postoutcome data were collected from FitnessGram test results, knowledge tests (PA and healthy eating), and accelerometer measures of PA in PE lessons over 4 days. Results included a significant difference in the percentage of students in the Healthy Fitness Zone between baseline and end of Year 2, a significant percentage gain on the PA/healthy eating knowledge test, and a significant but modest increase (approximately 2 min) in MVPA (during typical PE lessons) from baseline to end of Year 2. The mean number of daily MVPA minutes showed a statistically significant decrease over the course of the study, possibly attributed to seasonal sport offerings and inclement weather during final data collection (Metzler et al., 2015). The after-school program was also found to provide attending students with more than 25 min of MVPA. Based on a composite analysis, Metzler et al. (2015) found that the opportunities provided at the school (PA-focused QPE and after-school PA programming), and not those outside of the school, were key to students accumulating the 60 min of daily PA.

Teacher professional development and the influence on multicomponent CSPAP outcomes was examined in only one study. In a quasi-experimental cluster-controlled study, Carson, Castelli, Pulling Kuhn, et al. (2014) tested the effect of CSPAP professional development on school PA offerings, MVPA, and sedentary behaviors of students (aged 9–14) during school. Weeklong accelerometer measures (baseline/post) were taken for MVPA and sedentary behaviors. Results indicated that intervention teachers (those with CSPAP training/support during implementation) reported significantly more PA opportunities in two of the five components (PA during school and staff involvement in PA).

In relation to PA outcome measures, students spent less time in MVPA and more time in sedentary behaviors during school. The findings exhibit an overall in-school decline in MVPA minutes in control boys and girls, compared to a decline in girls in intervention schools (with no change occurring for boys attending intervention schools). The study by Carson, Castelli, Pulling Kuhn, et al. (2014) demonstrates the potential of a CSPAP professional development

program to influence PA opportunities offered and the ability to offset declines in students' MVPA and increases in students' sedentary behaviors over 1 school year.

The final three studies reviewed were situated in the context of a multicomponent CSPAP and included qualitative case study methodology. The first study was an exploratory single case study used to investigate an existing PE/sport/PA program in an urban Title I K–8 public school over 2 academic years. Doolittle and Rukavina (2014) recognized the similar aim of the CSPAP as a public health model and Lawson's propositions (as cited in Doolittle & Rukavina, 2014) for sport, exercise, and PE professionals and utilized both theories to examine the 10-year-old program.

Data were collected in the form of interviews, observations, and program artifacts and were then used to address questions related to the implementation and institutionalization of comprehensive PA programs and to inform practical implementation strategies for the CSPAP model in urban schools. According to Doolittle and Rukavina (2014), successful CSPAP implementation in the urban K–8 school depended on "building up practical resources, developing policies and practices that did not violate district rules, and finding ways and means to collaborate in the school and in the community" (p. 553).

In the second collective case study, Centeio, Erwin, and Castelli (2014) examined the perceptions and characteristics of elementary PE teachers during the implementation of CSPAP and the certification process of the director of physical activity (now called PAL). The results indicated that although there were barriers in the process of implementing PA opportunities, the teachers in this study focused more on the facilitators and were able to overcome some of the barriers with planning and action plans, supportive administration, and passion and dedication to the health of their students (Centeio, Erwin, & Castelli, 2014).

The last study reviewed was designed to examine CSPAP feasibility through a collective case study of 11 schools in a rural Appalachian county. Guided by a systems approach, Jones et al. (2014) sought to evaluate the contextual and organizational factors that contribute to or inhibit the feasibility of CSPAP development. The authors emphasized the need to evaluate "each school's systems, subsystems, contexts, and constraints individually to determine a

customized approach to CSPAP" (Jones et al., 2014, p. 485). For a CSPAP to be implemented effectively and to be "comprehensive" in nature, change and improvements are needed at the transformational level. Transformational factors (e.g., external environment, mission and strategy, leadership, and culture) and transactional factors (e.g., work climate, systems, organizational structure, task, and individual skills) were identified to have the potential to facilitate systemwide change (Jones et al., 2014).

Comprehensive School Physical Activity Program Adoption: Barriers and Facilitators

To align PE with public health goals, it is necessary to address some of the factors (McKenzie & Lounsbery, 2013) that might be impeding or facilitating progress toward this alignment.

Barriers

A better understanding of the variables influencing this process will "allow for the creation of focused, informed strategies to reduce or eliminate barriers and facilitate the adoption of a more physically active lifestyle" (Beighle & Morrow, 2014, p. 23). PA participation is a health behavior that is influenced not only at the individual level, but also at multiple levels from the surrounding environment (King, Stokols, Talen, Brassington, & Killingsworth, 2002). As a result, ecological models such as the social-ecological model have served as the theoretical foundation for implementing CSPAP models (Metzler et al., 2013) and other PA interventions (Sallis et al., 2008).

Ecological models provide comprehensive frameworks for understanding interacting determinants, as well as provide insight into various levels of influence on targeted health behaviors. Table 1 includes the multiple levels of influence (intrapersonal, interpersonal, organizational, community, and public policy) outlined by Sallis et al. (2008) and some of the cited barriers within each level that may inhibit CSPAP adoption and PA promotion efforts in schools. The table represents only a glimpse into barriers related to CSPAP adoption, but indicates the need for concerted efforts to reduce barriers at interpersonal (teacher) and organizational (school) levels.

Table 1
Ecological Level of Influence and Associated Barriers to CSPAP Adoption

Level of influence	Barriers to CSPAP adoption
Intrapersonal	Time limitations, motivation, energy, knowledge, environment, and confidence (Beighle & Morrow, 2014)
Interpersonal	Social barriers (socioeconomic status, cultural expectations, and support from family or friends) (Beighle & Morrow, 2014)
	Teacher time constraints; overextended teachers/school personnel who are hesitant to volunteer (Deslatte & Carson, 2014; Jones et al., 2014)
	Lack of knowledge or leadership needed to establish CSPAP culture and programming (Deslatte & Carson, 2014; Doolittle & Rukavina, 2014; Jones et al., 2014)
Organizational	School policies, building schedules, curriculum, resources, finances, and facilities; "perceived importance" of physical activity (Beighle & Morrow, 2014)
	Focus on academics (due to standardized testing pressures) (Deslatte & Carson, 2014)
	Lack of centralization within the program (Deslatte & Carson, 2014)
	Frequency and duration of classes; low student enrollment requirements (McKenzie & Lounsbery, 2013)
	Lack of administrative support (Jones et al., 2014; McKenzie & Lounsbery, 2013)
	Limited resources and space needed to plan, develop, and deliver programs; resources to train program supervisors and school personnel (Jones et al., 2014, Metzler et al., 2015)
Community	Logistical constraints (transportation, facility security and maintenance, and liability) (Jones et al., 2014)
Public Policy	Statewide policies, initiatives, and legislation (Beighle & Morrow, 2014); enactment of policies that encourage or mandate prevention efforts (Kelder et al., 2014)

From an ecological perspective, Sallis et al. (2008) pointed out that the "individual level and many levels of external influence are integrated in a single framework, making it clear that causation of behavior is widely distributed, not lodged in one or another source" (p. 482). Interventions should be composite or synergistic (King et al., 2002) and in order to intervene upon and promote PA behavior in any given population effectively, it is important to understand not only the influences that inhibit, but also those that facilitate the promotion of the targeted behavior.

Facilitators

PE teachers have been recognized as the most qualified for CSPAP leadership roles (Beighle, Erwin, Castelli, & Ernst, 2009), and training programs have been designed to assist teachers in becoming PA champions and advocates for QPE and PA in their respective schools. Most recently, SHAPE America, in partnership with the Let's Move! Active Schools program, has begun to offer professional development opportunities through the PAL Learning System and Training (SHAPE, 2015b). Additionally, Castelli and Beighle (2007) suggested one of first steps PE teachers can take to lead or direct PA efforts is to join their school's wellness team. For the school staff/wellness teams to expand the CSPAP model successfully, more support (financial, time, equipment, and personnel; Deslatte & Carson, 2014), action plans, and an overall dedication to the health of students is needed (Centeio, Somers, et al., 2014). Increased incorporation of the CSPAP framework into physical education teacher education (PETE) programs is also strongly recommended (Bulger, Housner, & Lee, 2008; Kelder et al., 2014).

Conceptual models have recently been proposed for more effective implementation and sustainability of CSPAPs (Webster, Beets, Weaver, Vazou, & Russ, 2015). One particular model is based on the premise of internal–external partnerships, which include specific strategies such as community-based participatory research, communities of practice, and service learning. All three strategies serve to complement the teacher (the CSPAP champion or leader) in implementation efforts (Webster et al., 2015). Utilizing communities of practice and school–university partnerships can assist in making professional development more scalable and sustainable (Bulger & Housner, 2009; Castelli, Centeio, & Nicksic, 2013).

Similar to how the existence and sustainability of a coordinated school health program is dependent on overall school environment, district infrastructure, and policy (Lohrmann, 2008), the effectiveness of a CSPAP is dependent on upstream influences (Kelder et al., 2014), which consist of procedures and policy that can facilitate or inhibit overall implementation and sustainability (IOM, 2013). Schools cannot be alone in making and sustaining the changes that will influence the PA behaviors of the nation's youth. Various stakeholders and multiple levels of support are needed for effective change to take place (IOM, 2013).

Future Research and Methodological Considerations

Efforts are currently being made in schools to increase opportunities for PA and to help students achieve 60 min/day of MVPA (USDHHS, 2008). However, it is still unclear how many of these efforts are guided by the CSPAP model and if in fact fidelity to the *full* CSPAP model is being achieved. It is becoming increasingly clear that one size does not fit all when it comes to CSPAP, and what works for one school, district, or county may not work the same in similar settings. Customized approaches to CSPAP implementation, extensive needs assessments, and additional feasibility studies are needed to examine each school thoroughly (Jones et al., 2014) and to address contextualized barriers that may be inhibiting full CSPAP adoption.

Another recommendation is to utilize available resources such as the CSPAP Policy Continuum (CDC, 2012), which was developed to support schools, districts, and states in the process of CSPAP adoption. It is imperative to understand what school-, district-, and state-level policies are in place to support and facilitate effective adoption (Kelder et al., 2014; Mckenzie & Lounsbery, 2013) and how policy can ensure sufficient opportunities are provided for students to meet the recommendation of 60 min/day of MVPA. The CSPAP Policy Continuum provides meaningful steps toward optimal policy and suggestions for monitoring the progress and sustainability of each CSPAP component. The application and usability of the continuum has been demonstrated in recent research (Doolittle & Rukavina, 2015) and can be used to assess the level of existing program elements compared to that of the five CSPAP components. Further application of tools such as the continuum (CDC, 2012) and

the step-by-step CSPAP guide for schools (CDC, 2013) will direct the field toward evidence-based best practices.

Adherence to a comprehensive and multilevel approach to CSPAP implementation also generates the need for additional theory-based research. To date, few researchers have utilized theory or models to guide intervention design in PA intervention studies (Ickes, Erwin, & Beighle, 2013). Theory-based programs are supported because they are known to "aid in the development of measurable program outcomes, help in the design of interventions, provide a framework for effective programming strategies, and increase the likelihood of successful replication" (Ickes et al., 2013, p. 925). Future application of theories such as the diffusion of innovations (Webster et al., 2015) and the social-ecological model should be strongly considered for investigations into CSPAP components and adoption of the full CSPAP model.

Complementary research methods, which utilize both quantitative and qualitative measures, may advance understanding of the complexities behind CSPAP and the interactions that take place within schools, PA behaviors of children and adolescents, and the training and professional development of preservice and in-service teachers (Castelli, Carson, & Kulinna, 2014). In accordance with McKenzie's (2007) assertion that in-service professional development and preservice preparation in PETE need substantial revisions, future research is still needed to examine preservice and in-service PE teachers' knowledge base and level of preparedness in relation to effective CSPAP implementation (Webster et al., 2015). Although various articles have addressed the implications for preservice teacher preparation and purposeful integration of CSPAP components into existing curriculums (Karp, Scruggs, Brown, & Kelder, 2014; McMullen, van der Mars, & Jahn, 2014), it is important to first understand what factors and levels of influence are inhibiting the adoption of CSPAP in schools at this time.

The purpose of this review was to examine the extent to which the CSPAP framework is currently being adopted and implemented in P–12 schools. Empirically, the reported outcomes associated with each CSPAP component are minimal, and the effect of full five-component interventions based on the CSPAP model is still unknown. What is also not apparent is the magnitude of the *C* in

CSPAP, that is, how comprehensively the model needs to be implemented to be successful (Deslatte & Carson, 2014); what PA outcomes can be achieved when all five components are in place (Erwin et al., 2014); and the feasibility and potential of PE teachers' attitudes toward implementing a CSPAP (Centeio, Erwin, & Castelli, 2014).

With increased promotion and implementation of CSPAPs in schools across the country, subsequent empirical studies need to be conducted to gain a better understanding of the feasibility of adopting the CSPAP framework into a sustainable practice. As evidenced by this review, future empirical research is needed to answer some of these remaining implementation and feasibility questions, many of which can be best addressed by those standing on the front lines of CSPAP implementation: the PE teachers. If PE teachers are going to assume the role of protagonist in adopting CSPAP in schools, then a more extensive examination into the influence of PE teachers on CSPAP-related outcomes is warranted.

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