Elementary School Classroom Teacher Delivered Physical Education: Costs, Benefits and Barriers

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Abstract

Given academic priorities and budgetary constraints in the current elementary school milieu, the classroom teacher will likely remain a primary physical education provider. Understanding classroom teachers' perspectives related to costs, benefits, and barriers to teaching physical education is essential to understanding physical education practices. Behavior choice theory was used as a framework to guide the investigation of teacher choices that influence physical activity behaviors of students. Elementary school classroom teachers were trained to use an evidence-based curriculum, supported with a 4-phase professional development program, and encouraged to provide consistent PE to their students. Eight teachers were purposefully selected and interviewed. Interview transcriptions were analyzed and yielded 187 meaning units and 23 themes. PE at the elementary school level included costs (e.g., actual instruction time, preparation time), barriers (e.g., equipment, environment, lack of training and support), and benefits (to students, teachers, and society) that impact classroom teachers' delivery of regular physical education. Results were discussed in terms of strategies for long-term professional development to overcome perceived costs and barriers to regular delivery of developmentally appropriate physical education (DAPE).

Elementary School Classroom Teacher Delivered Physical Education: Costs, Benefits and Barriers

Researchers and practitioners have documented the benefits of well-designed professional development programs to reduce classroom teachers' resistance to teaching physical education (e.g., Faucette, Nugent, Sallis, & McKenzie, 2002; McKenzie, Sallis, Kolody, & Faucette, 1997). Despite these efforts, elementary school classroom teachers with an aversion to teaching physical education remain pervasive (Ennis, 2006). In one state, new funding (approximately $40 million annually) is available to hire elementary school credentialed physical education teachers and potentially affect over 1000 elementary schools (see California Governor's Budget, 2007-08). This is not enough funding, however, to support PE credentialed teachers' direct services to all children on a regular basis (e.g., 3 or more times per week, 150 minutes per week). As a result, empowering classroom teachers to deliver regular physical education remains an important part of the equation in improving current health trends related to low physical activity rates.

Current health trends are alarming across the lifespan. Physical inactivity and unhealthy diets are the cause of well over 300,000 American deaths each year (U.S. Department of Health and Human Services, 2000). Recent reports of childhood obesity estimate the proportion of young people who are overweight or obese has more than doubled in the last 25 years, with even higher rates among subpopulations of economically disadvantaged children (Krebs, Jacobson, & American Academy of Pediatrics Committee on Nutrition, 2003; U.S. Department of Health and Human Services, 2001). Recent data from the National Center for Health Statistics (2005) indicate that approximately 30 percent of children and adolescents (aged 6 through 19) are over-

weight (BMI at or above the 85th percentile for age and gender) and 15 percent are obese (BMI at or above the 95th percentile for age and gender). Additionally, overweight and obese children are at risk of developing a range of serious short- and long-term physical and mental health problems (Dietz, 2004; Reilly et al., 2003; Pi-Sunyer, 1999; U.S. Department of Health and Human Services, 2001), these include, heart disease, hypertension, type II diabetes, various forms of cancer (e.g., colon, breast [postmenopausal], endometrial, and kidney), sleep apnea, depression, low self-esteem, diminished educational attainment and earned income, lower marriage rates, high morbidity and premature death. Peer isolation, peer rejection, and peer victimization are additional factors that contribute to or result from these serious health issues (Pearce, Boergers, & Prinstein, 2002; Strauss & Pollack, 2003). Furthermore, children who are overweight or obese tend to grow up and remain overweight or obese throughout their adulthood (Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). Alarmingly, almost 4 out of 5 obese young persons maintain this obesity as adults (American Obesity Association, 2005; Freedman, Kettel-Khan, & Dietz, 2001).

School-based physical activity (and dietary education) programs have the potential to positively influence childhood health indicators if evidenced-based physical activity programs are provided that focus on improving the quality of physical education (Faucette et al., 2002; McKenzie, Sallis, Faucette, Roby, & Kolody, 1993; McKenzie, Sallis, Kolody, & Faucette, 1997; Perry et al., 1997; Sallis et al., 1997). As of 2003, of the approximately 54 million children of age to attend primary or secondary level schools in the United States, almost 90 percent attend public schools (National Center for Educational Statistics, 2008). In addition, physical education programs in schools have been one recommended setting to begin the early promotion of health and emphasize the importance of physical activity (U.S. Department of Health and Human Services, 1996).

In addition to the physical activity and related health benefits of school-based, developmentally appropriate physical education (DAPE), research has shown that academic test scores do not drop when DAPE is included in the curriculum and health-related physical education may have a favorable effect on student academic achievement (Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001; Sallis et al., 1999; Shephard, 1997; Tremarche, Robinson, & Graham, 2007). Furthermore, in the secondary school grades evidence exists to support a positive relationship between sport and physical activity participation and academic performance (e.g., Marsh, 1993; Marsh & Kleitman, 2003). Despite the evidence in support of school-based physical activity opportunities for children, perceived and actual barriers exist prohibiting the inclusion of DAPE in many elementary schools (Ennis, 2006; Faucette et al., 2002). These barriers include: low priority resulting from "monumental pressures … to meet unprecedented standards in literacy and mathematics" (Ennis, 2006, p. 52), lack of necessary equipment and facilities to deliver DAPE, minimal staff development often resulting in under-prepared or apathetic teachers, lack of accountability for delivering quality physical education programs, and apathetic or unsupportive administrators.

With this growing body of evidence in favor of regular physical activity for health as well as academic reasons, attempts have been made to empower or train elementary classroom teachers to deliver DAPE (Faucette et al., 2002; McKenzie et al., 1997; McKenzie et al., 2001; Perry et al.). Results from a two-year professional development program (Faucette et al., 2002) indicated that classroom teachers were supportive of an ongoing professional development program and experienced firsthand, substantial improvements to their own physical education programs. In another study (McKenzie et al., 2001) the Coordinated Approach to Children's Health (CATCH) Program was shown to significantly increase the time students spent in moderate to vigorous physical activity (MVPA) for both specialist and classroom

teachers when compared to a control group. In-depth interviews of classroom teachers and PE specialists yielded information on positive features of the CATCH program: (a) students enjoyed participating in and teachers enjoyed teaching the program (b) the curriculum materials/ activity box was well organized and easy to use (c) appropriate training and necessary equipment were provided to support the program and (d) teachers agreed with the underlying philosophy of the CATCH program.

In another study investigating the long-term effects of the Sports, Play and Active Recreation for Kids (SPARK) Program (McKenzie et al., 1997), students in PE specialist schools engaged in 40.2 minutes of MVPA per week, compared to 32.7 minutes in teacher trained and 17.8 minutes in control schools. Although PE specialists provided the most MVPA, trained classroom teachers provided almost twice as much MVPA as nontrained classroom teachers. Both the PE specialists and trained teachers who implemented the SPARK PE curriculum had more active students, provided more time for learning PE content, and used more effective instructional behaviors than nontrained teachers.

Despite the availability of evidenced-based DAPE curricula (e.g., SPARK and CATCH), recent success in effectively training classroom teachers to deliver DAPE curricula, and current education codes that mandate physical education in the elementary grades (e.g., California Education Code, Section 51210), many elementary schools do not provide regular PE (California Center for Public Health Advocacy, 2006). This lack of compliance is problematic given the growing obesity epidemic as well as the strong research evidence in favor of DAPE programs and positive health indicators. Why are so many districts, schools, and teachers not able (or willing) to mandate, support, or regularly deliver DAPE? This research is focused on addressing this question from the teacher's perspective. Specifically, what are the costs, benefits, and barriers to teaching physical education?

According to Epstein and colleagues (Epstein, 1992; Epstein, 1998; Raynor, Coleman & Epstein, 1998), behavior choice theory and behavioral economic theory include numerous and complex factors needed to understand physical activity behavior choices. If participation in physical activity (or allocation of time and resources toward helping others engage in physical activity) is conceptualized as a series of choices, then it is crucial to understand factors that can influence those choices. Adults (e.g., teachers) are often in power positions to make choices that influence the physical activity behaviors of children. For example, teaching physical education or staying in the classroom to teach one of several other subjects is a choice teachers are faced with every day. A teacher's perspective of the reinforcing value and the accessibility of each option is essential to understanding the choices made. According to behavioral economic theory, the reinforcing value of each option is an important determinant in making choices. However, the accessibility of the alternatives also plays an important role. For example, teaching PE may be viewed as having reinforcing value (over not teaching PE) because it helps positively direct children's excessive energy, has a direct relationship with children's short- and long-term health, and is positively correlated with academic achievement. Its accessibility, however, may be viewed as marginal due to lack of training or comfort teaching in the subject area, poor facilities, insufficient equipment, hot temperatures (or some combination of these and other factors). The teacher may choose a less reinforcing alternative (staying in the classroom and showing a movie or providing free reading time) because the preferred alternative of teaching PE is less accessible. Understanding the costs and benefits (or reinforcers) of and barriers (perceived accessibility) to creating an environment that fosters positive physical activity behaviors for children (or challenging those environments that do not) is essential to understanding the previously posed question "Why districts, schools, and classroom

teachers are not able (or willing) to mandate, support, or deliver regular DAPE?"

The purpose of this study was to examine classroom teachers' perspectives regarding the cost, benefits, and barriers to teaching DAPE. A Physical Education Program (PEP) grant was awarded to the YMCA to support after-school and classroom based physical education at two large southern California school districts. The grant included training and support for classroom teachers including necessary equipment to support DAPE. It was expected that classroom teachers would offer their perspectives related to the costs, benefits, and barriers to delivering regular DAPE and that those perspectives could be understood within the framework of the relative reinforcing value and accessibility of competing behavioral choices.

Method

Participants

Eight classroom teachers were purposefully selected to participate in this study. Participant selection criteria for the eight teachers included: (a) participants must be a credentialed multiple-subject teacher at one of the eight targeted schools, (b) participants must have completed a 6-hour CATCH training (Phase 1 of professional development), (c) participants must be moderately or strongly committed to implementing the CATCH curriculum with their students on a regular schedule (2 to 4 days per week for 20 to 45 minutes) as determined by the PEP project coordinators/trainers, and (d) participants must be undergoing Phase 3 or Phase 4 of professional development during the interview (discussed below). Of 11 possible participants, eight were available and interested in participating in the study. Two of the 11 had extended absences (one on maternity leave and one extended illness) and one did not want to be interviewed.

Teachers were trained between August and October of 2005 by a CATCH Master Trainer and support staff. As part of the grant, teachers were provided with enough equipment to support DAPE with their class. Class sizes varied between 17 and 31 students. The eight teachers (4 female and 4 male) ranged in age from 32 to 55 years (M = 40.50, SD = 9.11). The teachers had between 4 and 34 years of teaching experience (M = 13, SD = 9.30) (See Table 1). Children were in either the 3rd or 5th grades and between 8 and 12 years of age.

Table 1. *Participant Demographics.*

Teacher	Age	Sex	Teaching Experience (yrs)
A	55	M	34
B	34	M	10
C	32	M	9
D	39	F	10
E	32	F	10
F	52	F	18
G	35	M	4
H	45	F	9

Overview of the Professional Development Program

The professional development program was delivered in four related and overlapping phases. In the initial phase, the CATCH training occurred. This standardized training lasted 6 hours and was a combination of didactic and activity-based training. A primary emphasis of the training was to provide several practical experiences for classroom teachers to participate in activities and then teach a selected activity to their peers. This training also introduced the classroom teacher to the CATCH box and the different cards for each part of a lesson (i.e., warm up, go fitness, go activity, cool down/take it home). Shortly after the initial training, all equipment and the curriculum box was delivered to the trained teachers. Per school agreement, trained teachers were the only teachers at the school allowed to use the equipment. As the year progressed, additional trainings were provided for untrained teachers and once

trained, those teachers had access to the equipment. Once the equipment and the curriculum (CATCH boxes) were delivered, peer modeling—the second phase of the professional development—began.

Peer modeling was characterized by the classroom teachers watching as a trainer taught the lesson (the trainer also planned the lesson and set up the teaching area). Peer modeling occurred one time per week—lasting 40 minutes—for at least four weeks and not more than 10 weeks depending on the classroom teacher's comfort level and initiative. At the end of this period, the third phase of professional development began—the co-teaching phase.

In the co-teaching phase, the classroom teacher and trainer shared the teaching duties. Initially, the trainer planned the lesson and set up the teaching area (as with the peer-modeling phase) and asked the classroom teacher to prepare to lead one activity (CATCH card for warm up or go fitness). Over a period of about 4 weeks (one 40-minute lesson per week), the classroom teacher was expected to assume more of the planning duties (using the CATCH curriculum box) and teach a larger portion of the lesson (e.g., warm up and go fitness or go activity). The classroom teacher was also asked to set up the teaching area (e.g., boundaries, grid, stations).

Phase four included full integration of planning and teaching where the classroom teacher was responsible for 100% of the teaching duties. In this phase, the trainer remained available (one time per week) and provided feedback, advised on activity selection and lesson design, and modeled teaching practices if requested. This phase lasted throughout the remainder of the school year.

Interview Guides

Semistructured interviews were conducted with all eight classroom teachers (CRT) by the second and third authors. The interview guide (Table 2) consisted of a set of questions and probes used to guide CRTs to elicit responses pertinent to their experiences related to the costs and benefits of, and barriers to, delivering DAPE. The questions specific to the cost, benefits, and barriers represented the framework for the inquiry and served to guide participants' responses accordingly. Probes were developed to encourage CRTs to clarify, elaborate, or embellish answers (Patton, 2005; Smith & Osborn, 2003). Questions and probes for the interview guide were developed by adhering to the tenets of behavioral choice theory, from the authors' experiences working with teachers and children in physical education settings, from feedback provided by the PEP program coordinators, and from familiarity with previous qualitative research with adults teaching or coaching children (Wiersma & Sherman, 2005).

Procedures

Permission to conduct this study was obtained from our university's institutional review board and the local school district boards. Eight classroom teachers who were trained in the CATCH curriculum; subsequently supported in phases two, three and four of the professional development; and were currently offering during school physical education were contacted and available to be interviewed. To set up the interviews, the eight teachers were contacted by phone or email, the study was described, and each teacher agreed to participate in the study. Interviews with the teachers were conducted before or after school at their respective schools in May or June of the 2006 school year. The interviews lasted between 25 and 55 minutes. Approximately nine months later (February and March of 2007) each teacher was contacted via phone and asked to participate in a follow-up interview to assess the sustainability of the program over a second academic year.

Data Analysis

Data analyses for the interviews were conducted inductively by following the strategies described by Patton (2005). Primarily, these

Table 2. *Interview Guide.*

1.	Please describe your physical education program (CATCH). Probe—What is a typical PE lesson like?
2.	Costs are the expenditure of something, such as time or labor in meeting PE objectives. What are the costs of offering the CATCH program? Probe—Are there any other costs you can think of?
3.	Barriers are any condition that makes it difficult to make progress toward achieving PE objectives. What barriers do you (or did you) face in implementing the CATCH program? Probe - Any other barriers?
4.	Which barriers did you overcome and how? Probe—Did you overcome any other barriers?
5.	Which barriers did you NOT overcome and why?
6.	Benefits are things that are advantageous or good related to PE. What are the benefits of offering the CATCH program? Probe—Any other benefits?
7.	Describe some ways your students were influenced by the program?
8.	What can the PE Specialists do differently next year to improve the PE program? Probe—Any other things they could do?

strategies allowed themes to emerge from the content communicated by the eight classroom teachers. Each audio-taped interview was transcribed verbatim and then analyzed by each of the three researchers. Prior to analysis, an electronic copy of each interview transcription was sent to the appropriate participant. Each participant was provided with the opportunity to send feedback related to the accuracy of the transcription. In all eight cases, either minor or no corrections were made.

Each researcher performed this first stage of analysis by separately reading each raw data quotation and recording a phrase (or phrases) that captured its meaning and would henceforth function as a meaning unit. These assigned phrases would later serve as codes to help organize the data into like groupings or themes. The researchers then met to discuss and agree on the raw data quotations and congruent meaning units to include in further analyses. Discussion among the researchers continued until a consensus was formed regarding relevant raw data quotations and subsequent phrasing for each meaning unit. For example, identical and similarly phrased meaning units were kept for further analysis (researchers decided on the best descriptor when the terminology, not the meaning, was in question). Meaning unit discrepancies were resolved through discourse among the researchers, discussing relevant meaning units in the context of the interview question.

Related meaning units were then combined into themes. Each theme was labeled to describe its underlying meaning. In all cases, themes were made up of two or more meaning units. The themes were then further analyzed to determine their fit within the framework of the study. At every point, the researchers analyzed the data independently prior to coming together to discuss findings and make decisions related to the groupings and further stages of analysis.

After the researchers agreed on the meaning unit groupings (i.e., themes), a peer debrief (qualitative methodology expert familiar with study content and goals) provided additional trustworthiness to the analysis. Specifically, the peer debrief analyzed the data looking for discrepancies in meaning units and theme construction. When asked for, the peer debrief was provided with the raw data (i.e., actual quotations) to help support the decisions made by the researchers regarding meaning unit phrasing, and theme composition. In several instances, the peer

debrief called into question the composition of a theme (e.g., logical inclusion of a meaning unit in a theme) and discussion ensued between the peer debrief and the research team until a consensus was reached.

Results

Raw data quotations from eight semistructured interviews provided the data for the following results. Content analysis yielded 23 themes related to CRT commitment to and follow-through in teaching physical education. Meaning units (187) and themes supported the framework for the study: costs, benefits, and barriers to teaching DAPE. Within this framework, each theme is discussed below and illustrated with examples from the eight participants' (i.e., CRTs') experiences. Figure 1 provides a visual display of these data with values in parentheses representing the number of participants contributing to the specific theme.

Costs to Teaching Physical Education at the Elementary School Level

Costs were defined as the expenditure of something, such as time or labor, necessary for the attainment of a goal. Each of the eight CRTs reported at least one cost related to teaching PE. Four themes represented these costs: (a) instructional time, (b) outside of class time, (c) during class time, and (d) school costs.

Instructional time. Five teachers reported dedicating about 100 minutes per week of the school day to PE instruction/participation. This was generally discussed in terms of number of times per week PE was taught and number of minutes per session. For example, Ms. D indicated teaching PE on Monday, Tuesday, and Friday for about 40 minutes each day. Mrs. F elaborated, "I do a little something everyday. Even if it's just 10 to 20 minutes would be my least amount of time. And then when [the trainer] comes on Thursdays we usually go from 8:15 to 9."

Ms. H explained,

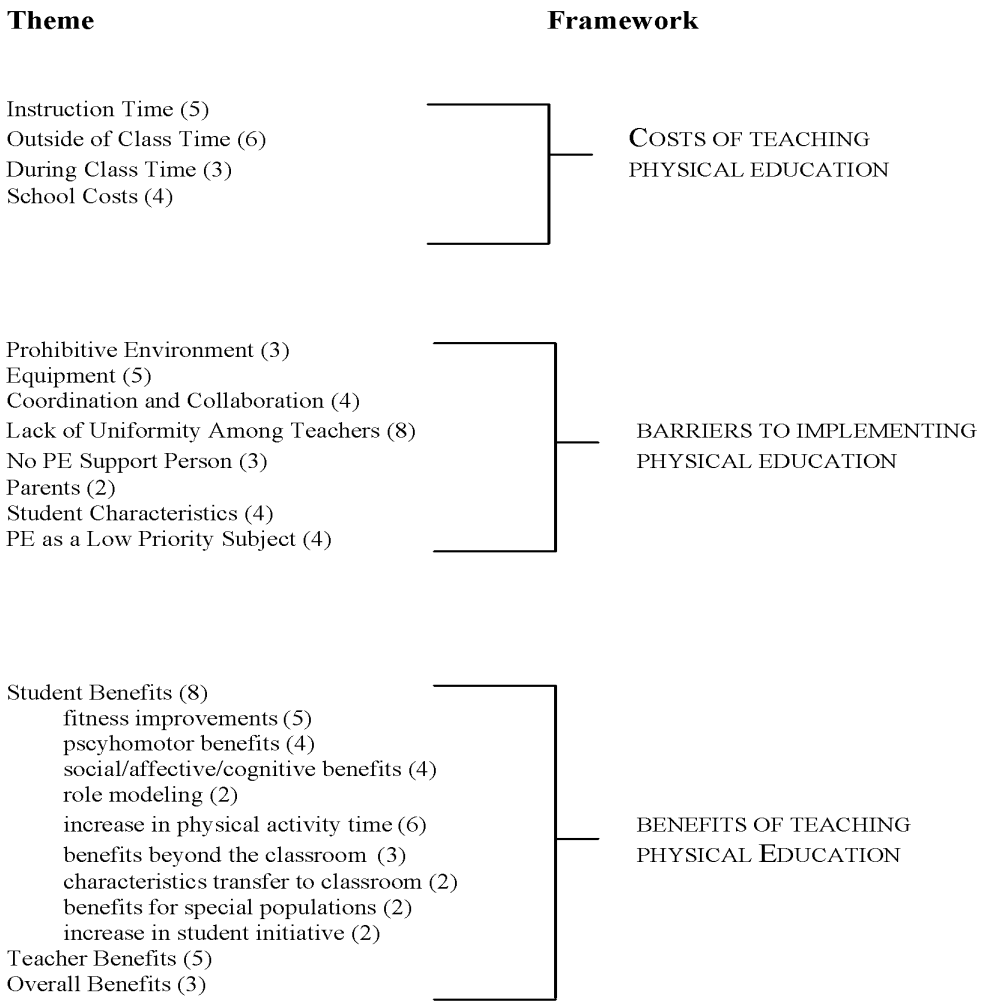
> I have extended my day so we do PE in the morning, every morning before school begins at 7:30 because I didn't have-wasn't finding time to do PE ever, ever. I'd never done physical education, ever, in the eight years that I've been teaching previous to this … .

Outside of class time. Six teachers reported spending time outside of class to support their efforts to teach PE. Examples included: (a) going to training, (b) planning/selecting activities from the CATCH box, (c) preparation time (lesson/activity rehearsal), (d) development of an equipment management protocol and coordinating equipment use with other teachers, and (e) anticipating and studying student health issues that could interfere their ability to safely participate in physical education. Mr. B reported, "Just an investment in time to go through the training and really it's nominal." Mrs. F commented, "… getting the activities planned and equipment out—sometimes that is time consuming."

During class time. Three teachers also reported spending during-class time to support the PE program. For example, teachers reported a need to: (a) get equipment and set up the lesson area, (b) develop strategies to help students transition back to the classroom, and (c) develop and demonstrate strategies for inclusion (e.g., for overweight and low skilled students). Mr. B explained, "I just have to go get the equipment because it's stored in one place." Mrs. E commented on the need for transition strategies, "If we go a day where I take them right out to PE and come back in … it is a little bit harder to calm them down just because they've been so active."

School costs. Four of the teachers identified costs that would be incurred by the school district to support teaching PE. For example, teachers identified that the school would need to allocate or purchase space (e.g., metal container) to store the PE equipment. Four teachers also mentioned

Figure 1. Themes emerged from 187 meaning units and supported framework.



the need to maintain and replace equipment after the grant-supported program ends. Mr. A mentioned the need to hire a PE specialist (i.e. credentialed PE teacher) to sustain the program after the grant runs out. Ms. H discussed equipment storage needs, "… the equipment [is] downstairs in the basement so … it's just a hassle. I've been trying all year long to get … a little storage container out here on the playground." Mr. G discussed the value in PE professional development opportunities for CRTs,

> We've never had anybody come in to train us to do PE. We've had trainers for language arts you know reading, writing, math, ELD all these different academic things, … so it's a great idea and I think that [the district] should train as many teacher [in PE] as possible.

Barriers to implementing Physical Education at

the Elementary School Level

Barriers were defined as any condition that makes it difficult to make progress or to achieve an objective. Eight themes were related to barriers to implementing PE at the elementary school level. These were: (a) prohibitive environment, (b) equipment, (c) coordination and collaboration, (d) lack of uniformity among teachers, (e) no PE support person, (f) parents, (g) student characteristics, and (h) physical education as a low priority subject.

Prohibitive environment. Three teachers identified the weather (e.g., Mr. A said "It can be very hot in the afternoon."), lack of open space, grass, or an indoor gym as factors that can be prohibitive in delivering DAPE.

Equipment. Equipment availability, accessibility, and maintenance were barriers discussed by five teachers. For example, Ms. H explained,

> We have to store the equipment downstairs in the basement, so although it's not inaccessible, it's just a hassle. As it stands right now I have to either send kids down to get it, which is scary. Or I have to be awake enough in the morning to realize that I need to go down and get it before they get there.

Coordination and collaboration. Four of the teachers indicated that coordination of time, space, and equipment represented barriers to teaching physical education. These teachers were aware that available equipment and space, and possible time slots during the school day, were finite factors and represented coordination challenges. For example Mr. C said,

> When we have the trainers come in and help us, our schedules are so packed with everything we do. We actually took out a computer time to … have the [PE] coordinators come in and do the PE lessons with us. So my kids only go, instead of going twice a week to computers, we go once a week and we do PE.

Lack of uniformity among teachers. All teachers discussed differences among their peers in terms of the physical education training they received, the value they give to physical education, and their philosophies of the role of physical education in the schools. Most indicated that many or all of their peers are not trained adequately to teach physical education effectively. For example, Mr. C said, "I really wanted more people to get the training and for one reason or another that just didn't happen." Four teachers reported a lack of seriousness in regards to PE. For example, Ms. D said,

> You're not going to have 100% of the staff buying into the program. There's still going to be some teachers who are either resistant or they're not really into PE. Or they take them out to do PE the way I told you before—which is like here's the ball, go play.

No PE support person. Three of the teachers mentioned the importance of a PE support person (e.g., PE Specialist) to initiate and support the PE program. These teachers indicated that without that person, the PE program would not exist. For example, Mr. A said, "We as elementary teachers are not very well trained in teaching PE. And it's amazing because … elementary kids, they need it the most in my opinion, and we're the ones who don't ever get any training."

Parents. Two teachers recognized parents as barriers to running an effective elementary school PE program. Poor physical activity role modeling, lack of parental support or prioritization, and uninformed parents were areas discussed by the teachers. After discussing student attire issues on PE days (e.g., inappropriate footwear, tight fitting clothing) and assumptions about how active students are after school and on weekends, Ms. D described this quite simply, "…what I'd like to have next year is more parent support." Mr. G stated,

> There's not enough information that is given to the parents [regarding health and physical education]. Maybe because they

> don't know or they don't care or they have other priorities which is true. [Many] have to work all day, two jobs and stuff like that, and that [is] a problem.

Student characteristics. Four teachers identified one or more student characteristics that served as barriers to implementing PE at the elementary school level. Student characteristics that were discussed in terms of barriers that made it difficult to teach PE were: (a) low skilled students, (b) students with low self-esteem, (c) overweight or obese students, (d) students who had low initial fitness level and experienced discomfort from fatigue, (e) lazy students, (f) students who were more introverted, and (g) students who were slow starters from initial inhibition, likely resulting from one or more of the above characteristics. For example, Mr. C described his observation that, "low skilled, low self-esteem, and overweight kids initially try to avoid PE from either [perceived] embarrassment or [real fatigue]." Ms. H who offered a before school PE program described one student, "I have a boy who really would benefit by coming out every morning but he's kind of lazy. I mean that it's hard for him. He doesn't want to put out the effort to get up early to come here and it shows." Ms. D described her observations pertaining to several students in her class,

> Well some kids have low self-esteem, and you know you're always gonna have students that don't feel like running; some of them have actual difficulty. Some of them are really aware of their, um you know, personal appearance so they know they're a little overweight.

Physical education as a low priority subject. Four of the teachers reported that physical education is a low priority subject because there is no time for it. Mr. A indicated "… the program was good, the information was good, but I didn't have time to implement it and I wasn't really comfortable with it because of my own lack of time to digest it all." Mr. B noted "… physical education is placed at the bottom of the list because …so much focus is placed on academics." Mr. A focused on at-home physical activity opportunities, "I think a greater problem is that schools [expect or mandate] too much homework and kids can't even go out and play when they're home."

Benefits of Teaching Physical Education at the Elementary School Level

Benefits were defined as things that were advantageous or good related to DAPE. Each of the eight teachers reported several benefits related to teaching PE. Eleven themes represented these benefits: (a) specific benefits to students included 9 sub-themes, (b) benefits to teachers, and (c) overall benefits related to having a PE program.

Student benefits. All teachers reported benefits to students in a variety of ways, most of which were categorized under the following areas: (a) fitness improvements, (b) psychomotor benefits, (c) social/affective/cognitive benefits, (d) role modeling, (e) increase in physical activity time, (f) benefits beyond the classroom, (g) characteristics transfer to classroom, (h) benefits for special populations, and (i) increase in student initiative. Mrs. F discussed the health-related benefits of the program "I just think that overall the class has really [progressed] a lot and I feel like oh my gosh they're right up there and I actually feel confident going into [the Fitnessgram test, mandated for 5th graders]." Mrs. E reported how much time students are engaged in physical activity and curricular effects on motivation.

> It's the way that the games are structured. That students are always doing something, not standing around and looking, they're not running just for the sake of running. The way the games are set up, they're always motivated by a certain goals to do their best … and it's the structure of the games. The program wouldn't be the same without [the curriculum].

Mr. B focused on a combination of student benefits,

> I think that when the students are outside

> running, elevating their heartbeat, interacting with their peers in a positive way, being competitive in a positive way where the whole class wins, I think that it increases their confidence. I think it gives them an experience that they can take for the rest of the day as opposed to just sitting down at their desk. I think it allows the kids who don't have as much English language ability to participate fully when they might not have those experiences [otherwise]. I think that it's a positive benefit all the way around and for their health … .

Teacher benefits. The benefits identified by five teachers covered a variety of aspects. For instance, the program improved their assessment skills and increased the number of teachers doing PE and helping some meet the state education code of 200 minutes every ten days. It was also mentioned how the program changed their attitudes about physical education in a positive way and how the students now hold the teachers accountable for making sure they have physical education class. Mr. B said, "I get the great satisfaction of seeing my students increase their physical fitness. I feel great about being a teacher because I actually see my students participating, all of them, almost the [entire] time." Mr. G described a paradigm shift in the way kids think about PE,

> Kids act differently. When it's not just play PE they know it's going to be structured PE. I mean [the kids yelled]-'let's go to PE, let's go to PE'-and they just meant they want to go play. They didn't mean PE, but [now] they want to do the games, they want to do the activities, they know what they're supposed to do and they want to do that!

Overall benefits. The importance of sport and physical education to help address health and weight issues was discussed by some teachers as a pervasive benefit of the program. Three teachers felt that the CATCH program addressed this growing trend in childhood obesity from a long-term perspective. Mr. B noted that the program's role in slowing obesity trends "increased physical fitness, increased social skills, learning games and skills they can apply to all other types of sports when they get older." The overall impact the program had on students, teachers, and the school was also mentioned. For example, Mr. C said,

> It teaches them that they can use their own resources at home and play these activities and teaches them activities that they can actually play with their friends at home as opposed to things that have to be organized by a teacher or instructor you know.

Year 2 Follow-Up with Seven Teachers

Approximately 1 year after the initial interview, each teacher was contacted via phone and asked a series of follow-up questions (see questions below) to assess the sustainability of the program over a second academic year. Seven of the eight teachers were available and willing to respond to the phone interview questions. This data was collected, summarized, and is reported below.

Question 1: On average, what is the number of minutes you teach PE per week THIS year? Three of seven teachers reported meeting or exceeding State Education Code requirements (> 100 minutes/wk). Two of seven reported nearly meeting the State requirements (> 75 minutes/ wk). One of seven reported teaching PE 35 minutes per week. One of the seven reported demonstrating and assigning daily PE homework with directions for student to complete at home after school. Students in this last class also receive 40 minutes on Friday ("game days") which were designed to help them apply activities practiced during the week at home.

Question 2: Are there any teachers at your school that were NOT trained last year, who teach PE this year? How many? Why do you think they are teaching PE this year? Two teachers reported an increase in teachers teaching PE at their school. In one of those schools, the PE committee (those

teachers trained the previous year) decided that only teachers who use the curriculum can use the PE equipment. The committee provided brief training and suggestions for using the curriculum ("the box"). There were three teachers who committed to teach PE at that school. Another school had a more liberal policy and let anyone use the equipment as long as they returned it. At that school, eight teachers started teaching PE at various times during the school year. One teacher changed schools, to a charter school (high performing students, but still drawn from the same lower-socioeconomic urban area). At the new school, all upper grade teachers (3rd through 5th grades) teach PE on a regular basis. At this charter school, the principal holds the teachers accountable for 200 minutes of PE instruction every 10 days. All upper-grade teachers at this school have a key to a "well-stocked" equipment room.

Four teachers reported that no additional teachers started teaching PE at their schools. At one of those four schools, however, the upper grade teachers piloted an optional "structured recess" period where CATCH activities were organized and led by the teachers without "recess duty." The teacher reported that organized recess was popular for many students. In fact, when the program was not offered on some days, due to a variety of possible factors, the students complained.

Question 3: What barriers exist that may prevent you (or other teachers) from regularly teaching CATCH this year? Most of the barriers discussed by teachers in response to this question remained the same as the previous year. Five of the seven teachers mentioned academic priorities as a continuing barrier to teaching regular physical education. A prevailing emphasis on language arts and mathematics ("language arts and math are untouchable") continues to prevent teachers from regularly teaching other subjects areas. For example, at one school, all classes are required to provide a language arts block from 8:45 to 11:30. Any teacher providing PE instruction must do it after lunch. As a result, heat, space availability, and equipment availability are prohibitive factors. Two of the teachers mentioned that equipment storage and sharing among teachers remained a barrier. For these teachers, the inconvenience of "finding" equipment remained a challenge. In addition, at one of the schools, the principal had still not followed through on his promise to purchase an outside storage bin. At the other school, equipment replacement and maintenance was a prohibitive factor. Other factors, such as a shortened school day (due to a return to traditional school-year schedule, from year-round scheduling) and teacher pregnancy were reported as barriers to teaching physical education.

Discussion

The purpose of our study was to gain knowledge about the costs and benefits of, and barriers to, DAPE from classroom teachers' perspectives. Others (Faucette et al., 2002) have asked similar questions, but their work was conducted in the early 1990s. We were interested in confirming barriers discussed in the Faucette et al. study and determining if additional barriers exist. This study also investigated the costs and benefits of teaching DAPE. In addition, the professional development offered in the Faucette et al. study was extensive, comprising 11 sessions at 2 to 3 hours per session as well as additional twice weekly and then weekly individual sessions as the program progressed. The professional development model adopted to train CRTs in this research was more streamlined (perhaps more practical in terms of a replicable and sustainable program) and less demanding of the CRT. For example, all but one training session occurred during normal class time (i.e. students present and engaged in DAPE) while teachers observed, assisted with, or led DAPE and the trainer modeled or coached, and worked one-on-one with the CRT.

Results of this study indicated that the professional development program was successful as most CRTs reported successfully implementing

DAPE for the professional development year. Although CRTs identified important barriers to, and costs of, teaching DAPE on a consistent basis, all CRTs interviewed discussed important student benefits, and several discussed teacher and societal benefits. In addition, five of the eight trained teachers interviewed reported to continue to provide consistent DAPE during Year 2 without additional support. Two additional teachers (from the eight interviewed) remained philosophically invested in providing DAPE and discussed innovative ways to create physical activity opportunities for their students despite institutional barriers. Additionally, two of the seven CRTs who completed follow-up interviews reported additional teachers at their school who were now teaching PE, despite not undergoing any formal training or support. In summary, the immediate and long-term (i.e., Year 2) benefits of the professional development efforts resulted in consistently-delivered DAPE, and in some cases initiated a movement toward regularly delivered DAPE at a particular school.

The professional development program was created by a multi-agency, multi-professional effort including two school districts, CATCH curriculum and training coordinators, a federal agency, a university, and a youth service organization. As the program evolved, teachers were expected to gradually take more responsibility in planning and delivering the physical education lessons. Adult learning theory supported the strategy of increasing expectations and relinquishing control as learners become more empowered (e.g., Cranton, 1996). The program was designed for progressive and systematic learning opportunities for teachers who all began with unique personal characteristics and varying levels of program commitment and comfort teaching physical education. PE trainers were sensitive to these contextual differences and as a result were flexible in implementing the 4-phase professional development program with a consistent focus toward increasing autonomy and confidence planning and teaching physical education.

Despite the current professional development efforts, CRTs in this study identified numerous barriers to teaching consistent DAPE. The most frequently mentioned barriers included: administrators' (and peers') treatment of PE as a low priority subject, lack of teacher education to value and training to deliver DAPE, and equipment storage or use coordination. These finding support findings by Faucette et al. (2002), who also found equipment management, physical education scheduling, and limited training and experience in physical education to be teacher reported program barriers. In this study, Phase 2 and 3 of the professional development were devoted to repeated opportunities for PE trainers to model complete or part of a physical education lesson. As such, this was not a barrier reported by CRTs as it was during Year 1 in the Faucette et al. study.

This study also supported opinions espoused by Ennis (2006) which suggested that monumental pressures exist in public schools to focus on literacy and mathematics. Most teachers in this study discussed the pressures to teach to these two "untouchable" subject areas for the majority of the school day. As with the Maryland Department of Education's decision to require uninterrupted blocks of 150 minutes of reading and 120 minutes of mathematics every day for primary level students (as cited by Ennis, 2006), two teachers in this study reported a similar block schedule as a significant barrier to teaching consistent DAPE.

In support of program enablers reported by Faucette et al. (2002), this study found that CRTs also valued the modeling of physical education, on-site support by a PES, a collaborative approach where the PES co-taught and supported the CRT (during Phase 3), and a preplanned, varied, progressive and DAPE curriculum. This study also provided the opportunity to look closely at program costs and benefits. Although all eight CRTs interviewed reported costs to teaching PE, most discussed those costs as minimally invasive, that is, costs were assumed and paid for the opportunity to provide DAPE to their students. These costs were often inconveniences, but nominal. Four of the 8 CRTs recognized school or district "payments" as necessary to support and sustain

the PE program. For example, equipment storage, replacement, and maintenance; hiring personnel (like a PE Specialist) to continue to train and support CRTs; and additional in-service training were all discussed as costs that would need to be paid to sustain the program. These findings were consistent with district administrators' perceptions and needs for elementary school PE (Sallis, McKenzie, Kolody, & Curtis, 1996).

Benefits to students, teachers and society were consistently identified by the teachers. All eight teachers identified multiple benefits to students. Most teachers discussed benefits that were grouped into four or more of the nine sub-themes. As a result, reported student benefits were encompassing of more than just the typical fitness and psychomotor benefits. Teachers were cognizant of a broader scope of benefits including: increased physical activity time, positive characteristics gained from DAPE that transfer to the classroom, opportunities for positive role modeling (teacher and peers), and social and affective benefits for special populations who may seldom receive positive strokes in the classroom environment.

Feedback from participants related to the effectiveness of the Professional Development Program (PDP) was favorable. Most participants felt the training progression, equipment, and curriculum provided the structure for an easy transition to planning and delivering consistent DAPE. Although most teachers were aware of existing institutional barriers, most also felt empowered to plan and deliver DAPE to their students.

This PDP model seems particularly relevant given the need to determine the most practical and effective approaches to improve elementary school physical education in states that rely heavily on classroom teachers to deliver the PE program. How can this funding best be spent? This model provides some evidence that credentialed PE teachers can effectively serve as both direct service providers (e.g., teach PE once per week) and indirect service providers (e.g., model PE once per week and support, coach, enable classroom teachers in providing PE to students an additional 2 or more times per week). This study provided evidence that a credentialed PE teacher could provide those direct and indirect services at a large (500 to 700 student) elementary school and allow students attending those schools to meet or exceed minimum daily physical activity guidelines, meet national and/or state standards for physical education, and ultimately, increase their chances of experiencing short- and long-term benefits of a physically active lifestyle.

This study relied on the truthfulness of classroom teacher interviews (initial interview conducted in person and follow-up interview conducted by phone) in gathering information about their perspectives about the cost, benefits, and barriers to teaching DAPE. The classroom teachers were exposed to an intensive, four phase, professional development program that lasted between 5 and 7 months where they were supported weekly by a PE specialist. The results of this study provide some evidence that a progressive, year-long professional development program can effectively educate, train, and support CRTs in planning and delivering DAPE. Furthermore, the bulk of the professional development can be the result of collaboration between a PE specialist and a classroom teacher implemented during class time: a minimally invasive and ecologically valid format. Future research in this area ought to encompass administrators' perceptions of the importance and practicality of educating, training, and supporting CRTs in regularly delivering DAPE. In this study, CRTs reported institutional barriers that are likely related to school and district administrator's subject area policies. Additional research is also needed to further support the relationship between physical activity and academic test scores.

In conclusion, elementary school classroom teachers are an important part of the equation in arresting current health trends related to low physical activity rates. Through their academic priorities and teaching behaviors, CRTs can choose to provide healthy, enjoyable, and developmentally appropriate physical education for their students. Just as teachers accept a large responsibility in delivering DAPE to their

students, the schools and districts in which they work have an equally important responsibility in ensuring that teachers are equipped to deliver DAPE. School administrators should structure and offer professional development programs that encompass the perspectives of elementary CRTs who have undergone such training.

REFERENCES

American Obesity Association. (2005). *AOA fact sheet*. www.obesity.org/subs/fastfacts/aoafactsheet.shtml

California Center for Public Health Advocacy. (2006). *Dropping the Ball: Schools fail to meet physical education mandates*. http://www.publichealthadvocacy.org/droppingtheball.html

Cranton, P. (1996). Professional development as transformative learning: New perspective for teachers of adults. San Francisco: Jossey-Bass.

Dietz, W.H. (2004). Overweight in childhood and adolescence. New England Journal of Medicine, 350, 855-857.

Dwyer, T., Sallis, J.F., Blizzard, L., Lazarus, R., & Dean, K. (2001). Relation of academic performance to physical activity and fitness in children. *Pediatric Exercise Science, 13*, 225-237.

Ennis, C.D. (2006). Curriculum: Forming and reshaping the vision of physical education in a high need, low demand world of schools. *Quest, 58*, 41-59.

Epstein, L.H. (1992). Role of behavior theory in behavioral medicine. *Journal of Consulting and Clinical Psychology, 60*, 493-498.

Epstein, L.H. (1998). Integrating theoretical approaches to promote physical activity. *American Journal of Preventive Medicine, 15,* 257-265.

Faucette, N., Nugent, P., Sallis, J.F., & McKenzie, T.L. (2002). "I'd rather chew on aluminum foil." Overcoming classroom teachers' resistance to teaching physical education. *Journal of Teaching in Physical Education, 21,* 287-308.

Freedman, D.S., Kettel-Khan, L., & Dietz, W.H. (2001). Relationship of childhood obesity to coronary heart disease risk factors in adulthood: the Bogalusa Heart Study. Pediatrics, 108, 712-718.

Krebs, N.F., & Jacobson, M.S. (2003). American Academy of Pediatrics Committee on Nutrition policy statement: Prevention of pediatric overweight and obesity. Pediatrics, 112, 424-430.

Marsh, H. W. (1993). The effects of participation in sport during the last 2 years of high school. *Sociology of Sport Journal, 10*, 18-43.

Marsh, H. W., & & Kleitman, S. (2003). School athletic participation: mostly gain with little pain. *Journal of Sport and Exercise Psychology, 25*, 205-228.

McKenzie, T.L., Sallis, J.F., Faucette, N., Roby, J., & Kolody, B. (1993). Effects of a curricular and in-service program on the quantity and quality of elementary physical education classes. Research Quarterly for Exercise and Sport, 64, 178- 187.

McKenzie, T. L., Sallis, J. F., Kolody, B., & Faucette, F.N. (1997). Long-term effects of a physical education curriculum and staff development program: SPARK. *Research Quarterly for Exercise and Sport, 68*, 280-291.

McKenzie, T.L., Stone, E.J., Feldman, H.A., Epping, J.N., Yang, M., Stikmiller, P.K. et al. (2001). Effects of the CATCH physical education intervention: Teacher type and lesson location. *American Journal of Preventive Medicine, 21*, 101-109.

National Center for Educational Statistics. Digest of Educational Statistics. Retrieved May 5, 208 from http://nces.ed.gov/programs/digest/2007menu_tables.asp.

National Center for Health Statistics. (2005). Health, United States, 2005. Washington, DC: U.S. Government Printing Office.

Patton, M.Q. (2005). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

Pearce, M.J., Boergers, J., & Prinstein, M.J. (2002). Adolescent obesity, overt and relational peer victimization, and romantic relationships. Obesity Research, 10, 386-393.

Perry C.L., Sellers D., Johnson C.C., Pedersen S.A., Bachman K.J., Parcel G.S. et al. (1997). The Child and Adolescent Trial for Cardiovascular Health (CATCH): Intervention, implementation, and feasibility for elementary schools in the United States. *Health Education and Behavior, 24*, 716-735.

Pi-Sunyer, F.X. (1999). Comorbidities of overweight and obesity: current evidence and research issues. Medicine and Science in Sports and Exercise, 31, S602-S608.

Raynor, D.A., Coleman, K.J., & Epstein, L.H. (1998). Effects of proximity on the choice to be physically active or sedentary. *Research Quarterly for Exercise and Sport, 69*, 99-103.

Reilly, J.J., Methven, E., McDowell, Z.C., Hacking, B., Alexander, D., Stewart, L., et al. (2003). Health consequences of obesity. Archives of Disease in Childhood, 88, 748-752.

Sallis, J.F., McKenzie, T.L., Alcaraz, J.E., Kolody, B., Faucette, N., & Hovell, M.F. (1997). The effects of a 2-year physical education program (SPARK) on physical activity and fitness in elementary school students. *American Journal of Public Health, 87*, 1328-1334.

Sallis, J.F., McKenzie, T.L., Kolody, B., & Curtis, P. (1996). Assessing district administrators' perceptions of elementary school physical education. *Journal of Physical Education, Recreation, and Dance, 67*(8), 25-29.

Sallis, J.F., McKenzie, T.L., Kolody, B., Lewis, M., Marshall, S., & Rosengard, P. (1999). Effects of health-related physical education on academic achievement: Project SPARK. *Research Quarterly for Exercise and Sport, 70*, 127-134.

Shephard, R.J. (1997). Curricular physical activity and academic performance. *Pediatric Exercise Science, 9,* 113-126.

Smith, J.A., & Osborn, M. (2003). Interpretive phenomenological analysis. In J.A. Smith (Ed.), *Qualitative psychology: A practical guide to research methods* (pp. 51-80). Thousand Oaks, CA: Sage.

Strauss, R.S., & Pollack, H.A. (2003). Social marginalization of overweight children. Archives of Pediatric and Adolescent Medicine, 157, 746-752.

Tremarche, P., Robinson, E., & Graham, L. (2007). Physical education and its effect on elementary testing results. *Physical Educator, 64*, 58-64.

U.S. Department of Health and Human Services. (1996). Physical activity and Health: A report of the Surgeon General. Atlanta, GA: Centers for Disease Control.

U.S. Department of Health and Human Services. (2000). Healthy people 2010: understanding and improving health, 2nd ed. Washington, DC: US Department of Health and Human Services.

U.S. Department of Health and Human Services (2001). The Surgeon General's call to action to prevent and decrease overweight and obesity (Publication No. WD210S9593). Rockville, MD: National Institutes of Health, Centers for Disease Control and Prevention, Office of Research Prevention and Health Promotion.

Wiersma, L.D., & Sherman, C.P. (2005). Volunteer youth sport coaches' perspectives of coaching education/certification and parental codes of conduct. *Research Quarterly for Exercise and Sport, 76,* 324-338.

Whitaker, R.C., Wright, J.A., Pepe, M.S., Seidel, K.D., & Dietz, W. H. (1997). Predicting obesity in young adulthood from childhood and parental obesity. New England Journal of Medicine, 337, 869-873.

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