

STATE OF THE ART
ReviewsThomas L. McKenzie, PhD, FACSM,
and Monica A. F. Lounsbery, PhDSchool Physical Education:
The Pill Not Taken

Abstract: *Physical education programs in schools have the potential to promote healthy, active lifestyles by providing children with some of their recommended physical activity, increasing their physical fitness levels, and teaching them generalizable movement and behavioral skills. If “exercise is medicine,” physical education is the pill not taken. Numerous barriers, including limited curriculum time allocations, low subject status, and inadequate resources hinder physical education from playing a major role in providing and promoting physical activity. This article profiles physical education as it relates to physical activity, describes its current status from both historical and contextual standpoints, and concludes with recommendations for improving it.*

Keywords: physical activity; exercise; children; youths; school; physical fitness

Sedentary living has been identified as a public health problem around the world,^{1,2} and its costs and consequences are enormous and growing.^{3,4} Although much more is known about the health benefits of physical activity in adults than in youths,⁵ physical activity during childhood and adolescence tracks into adulthood,^{6,7} and there are some immediate benefits.^{8,9} For example, children's habitual physical activity is positively associated with

most health-related fitness components,¹⁰ and increases in physical activity and fitness are related to improved measures of health.⁹ In addition, reviews of the scientific literature indicate that physical activity reduces the risk of cardiovascular disease, overweight, and type 2 diabetes, and vigorous activity helps increase the strength and density of bones. Improvements in flexibility, muscular strength, and bone health not only advance movement and sport-related performances but are also thought to be related to reduced back pain and fractures in adulthood.¹¹ Vigorous physical activity may also help improve psychological health and mood and can assist in reducing blood pressure and increasing high-density lipoprotein (HDL)-cholesterol among high-risk youths.⁹

Despite the many documented benefits of physical activity, numerous reports suggest that all segments of the population, including children and youths, do not engage in sufficient activity for health purposes.^{9,12,13} One study indicated that 61.5% of 9- to 13 year-old children did not participate in any organized physical activity during nonschool hours, and 22.6% did not engage in any leisure-time physical activity.¹⁴ An expert panel recently recommended that children and youths participate in 60 or more minutes per day of physical activity that is developmentally appropriate, is enjoyable, and involves a variety of activities.⁹ This 60-minute per day goal is also

reflected in the *Dietary Guidelines for Americans, 2005*.¹⁵ Both reports suggest that recommended activity can be accumulated throughout the day and in various settings.

For 12 years, children spend a significant proportion of their waking day in school, and over time, experiences at schools affect nearly the entire population. For these reasons, schools have an enormous role to play in the effort to increase physical activity.^{13,16} The World Health Organization suggests that schools are one of the most cost-effective investments a state or nation can make to improve education and health simultaneously.² Numerous agencies and organizations support the involvement of the schools in physical activity and its promotion, including the American Heart Association,⁹ American Academy of Pediatrics,¹⁷ Centers for Disease Control and Prevention,¹⁸ and the US Department of Health and Human Services.¹² In addition, *Healthy People 2010: Health Objectives for the Nation*¹ includes strong support for the promotion of physical activity in schools, both within and outside of physical education (PE) classes. However, in the context of increased global concern about physical inactivity,^{1,12} most school programs engender sedentary behavior, and the prevalence of physical activity-producing programs, including physical education, is decreasing.^{19,20}

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Physical education has become institutionalized in schools in the United States and other developed countries,^{2,19} and it is highly recommended as a venue for increasing physical activity.²¹ Most children, however, do not have physical education regularly, and studies suggest that children do not compensate by increasing their physical activity at home or in the community after they miss physical education or experience a sedentary day at school.^{22,23} In addition, Datar and Sturm²⁴ have estimated that increasing physical education instruction in kindergarten and first grade by as little as 1 hour per week could reduce the number of overweight 5- and 6-year-old girls nationally by as much as 10%.

In the United States, physical education is recognized as an important component of coordinated and comprehensive school health programs,²⁵ and it is mandated as a curriculum area in nearly all 50 states.²⁶ Physical education is the only setting where some children, particularly those from poor families, can accrue vigorous physical activity and learn important generalizable movement skills. It is also 1 of only 5 interventions strongly recommended for increasing physical activity by the national Task Force on Community Preventive Services.²¹ *Healthy People 2010* objectives related to the promotion of moderate and vigorous physical activity (MVPA) include the provision of school physical education on a daily basis and conducting physical education lessons that are physically active at least 50% of the time. However, the reality in schools is that multiple barriers hinder the quantity and quality of physical education programming, and this has enormous implications for providing optimal levels of physical activity for school-aged children.

For many outside the physical education profession, there is a lack of historical and contextual understanding about the status of school programs related to providing and promoting physical activity. Therefore, the purpose of this article is to provide an overview of school physical education in this regard. Our goal is to describe the status of physical education and to offer an explanation from a

historical and contextual standpoint. To accomplish this, we first provide a profile of physical education while attending specifically to the quantity and quality of programming as it relates to physical activity. Next, we provide an explanation of the status of physical education from both a historical and contextual perspective, and on closing, we make the case that widespread change is possible through policy change and identify specific recommendations toward this end.

Profile of Physical Education

General Description

As stated previously, daily physical education for all students is frequently recommended by health authorities,^{13,18,21} but no federal law requires it. The National Association for Sport and Physical Education (NASPE) recommends that elementary schools provide 150 minutes of physical education per week and that secondary schools provide 225 minutes, with some instruction offered every day.²⁷ Many state mandates fall far short of these recommendations, and some do not require physical education at all. “National” professional standards for physical education programs in kindergarten through 12th grade exist,²⁸ but they are general and broad and are designed to accommodate a spectrum of educational philosophies and practices.²⁹ “National” professional standards for the preparation of physical education teachers also exist,³⁰ but similar to standards for physical education programs, they are advisory and without legal status or funding.

With more than 100 000 K-12 school campuses in the United States, obtaining generalizable data is challenging, and most of the information available on physical education programs comes from studies using self-reports. The School Health Policies and Programs Study (SHPPS) is the most comprehensive of the limited number of national reports on physical education, and it has been conducted to assess school health policies and programs every 6 years since 1994.^{29,30}

Of the nearly 1000 schools nationwide that reported for the 2006 SHPPS, 78.3% required students to take at least some physical education, about a 10% increase from the 2000 SHPPS. Approximately 69% of elementary schools, 84% of middle schools, and 95% of high schools required at least some physical education.³⁰ Few schools, however, provided physical education daily. Only 3.8% of elementary schools, 7.9% of middle schools, and 2.1% of high schools reported that their students had daily physical education or its per week minute equivalent (ie, 150 minutes for elementary or 225 minutes for middle and high schools). Results also showed that requirements for enrolling in physical education varied widely across grade levels, with some physical education most frequently being required in 6th grade (68.1% of eligible schools) and least often in 10th, 11th, and 12th grades (33.2%, 20.2%, and 20.4% of schools, respectively).²⁹

For physical education to be conducted in a safe and effective manner, NASPE recommends a teacher-to-student ratio be no greater than 1:25 for elementary schools, 1:30 for middle schools, and 1:35 for high schools.³¹ SHPPS data, however, indicated that only 36% of schools had a policy related to the maximum allowable student-to-teacher ratio for physical education.²⁹ Large class size requires more teacher management time and compromises students’ opportunities for physical activity.³²

Schools also do not employ enough physical education specialists to enable all students to receive physical education daily or even 3 times per week.^{27,29} If provided at all in some elementary schools, physical education is taught frequently by classroom teachers, many of whom have not had adequate preparation in the subject matter and how to deliver it effectively. It is unfortunate that classes are not taught by specialist teachers because they typically produce more favorable physical activity, fitness, and skill outcomes than classes delivered by nonspecialist teachers.^{33,34} To compensate for limited state and district budgets, schools often attempt to raise monies from other sources (eg, Parent-Teacher Associations,

grants) to help provide physical education personnel and equipment. They often hire temporary teachers who may be inadequately prepared and have high turnover rates. As a result, school programs may lack focus and continuity.

School districts often have separate policies for staff development, grade levels that receive physical education, and who teaches classes. In addition, there is variation in how much physical activity children will accrue in physical education among schools themselves, even when there is a standardized curriculum.³⁵⁻³⁷ Variation can result from distal factors such as community demographic characteristics, facilities, site-based management policies, and the school calendar. In addition, variability can result from more immediate factors, such as lesson goals, subject matter content (eg, aerobic dance vs softball), lesson placement within an instructional unit, teacher behavior (eg, physical activity prompts and consequences), available equipment (eg, a ball for each child), and facilities used during the lesson (eg, size and quality of indoor and outdoor spaces).³⁵ Overall, elementary and secondary schools provide substantially different types of physical education programs and other opportunities for physical activity. Secondary schools employ relatively more physical education specialists, provide longer physical education classes, and have more physical activity facilities. Elementary schools, on the other hand, offer more free play and unstructured physical activity opportunities, such as recess and lunch breaks.

Physical Activity in Physical Education

Using direct observation in physical education classes yields information that is substantially different from the global picture provided by surveys, and it helps to provide more accurate data on how much physical activity children actually accrue. Direct measures using validated systems typically show children rarely engage in programs that reach national recommendations for physical activity. For example, third-grade children in 684 different elementary schools in 10 states

averaged participating in 2.1 lessons per week (mean length = 33 minutes).³⁸ Less than 6% of the children in these schools had physical education daily, and during individual lessons, they accrued only 4.8 vigorous and 11.9 MVPA minutes, which were 15.0% and 37.0% of class time, respectively. As is typical in both physical education and leisure-time periods in schools,³⁹ boys spent proportionately more time in vigorous and moderate physical activity than girls. Another study conducted in 96 schools in 4 regions of the United States found that third graders engaged in MVPA only 36% of class time.⁴⁰ There were substantial regional differences in the frequency and length of lessons as well as in the amount of physical activity that children accrued during them. Overall, physical education classes provided children with only 6% of the weekly total of MVPA recommended

to produce substantial physical activity gains, although specialists still taught lessons that were more consistent and of higher quality.^{42,44} Studies have also shown that physical fitness⁴⁴ and motor skills⁴⁵ can be improved, and these factors have potential for increasing out-of-school physical activity. The durability (ie, maintenance) of staff development programs, at least in elementary schools, has been associated with the availability of equipment and support for physical education by the school principal and other teachers in the school.^{42,46,47}

No substantial data indicate that knowledge-based physical education curricula (eg, focusing on parts of the body and how they function) increase lifestyle physical activity. On the other hand, including components in physical education that focus on developing behavioral skills holds promise. Children as

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for health. A middle school study conducted in 6 states showed that adolescent girls engaged in MVPA during 37.9% of class time and accumulated an average total of 13.9 minutes per lesson.⁴¹ Observations have also shown that actual lesson length (ie, the amount of time that students spend in the instructional station) in middle schools is only about 78% of the scheduled lesson length^{32,41} and that teachers spend little class time promoting physical activity beyond the current lesson.⁴¹

Over the past 30 years, numerous large-scale intervention studies have targeted increased physical activity levels during physical education. Some studies have shown that MVPA in physical education classes can be increased to about 18% during interventions, even without increasing the frequency or duration of lessons.^{42,43} In elementary schools, both physical education specialists and classroom teachers have been shown

early as the fourth grade can master the important self-management skills of goal setting, self-monitoring, planning for activity, soliciting parent and peer support, self-reward, and resistance training.⁴⁸ Although children in elementary schools can learn the behavioral skills associated with having an active lifestyle, it is important to realize that their parents control most of the rules (eg, where and when to play and exercise) and resources (eg, transportation and fees for lessons) related to their physical activity.

The above profile has provided a general description of the status of physical education, what is scientifically known about physical activity levels during class time, and, from intervention studies, the potential that exists to increase activity. Throughout the profile, we have highlighted barriers to increasing the quantity and quality of programming, some of which include inadequate requirements for student enrollment, large class sizes,

underprepared classroom teachers implementing programs, few requirements for teacher professional development, and problems associated with content offerings (eg, national standards vs national curriculum). What follows is an explanatory overview of the status of physical education from both a historical and contextual perspective.

Explanatory Overview of Physical Education's Status

It is important to understand the foundational roots of school physical education and its evolution in the K-12 public school curriculum over time as these have implications for the widespread content disparity that exists today. The founding fathers of physical education were medical doctors, and at least to some extent, the profession has been concerned about promoting fitness and health since its beginning more than 100 years ago. Charles Bucher, in the fifth edition of his text, *Foundations of Physical Education*, wrote the following more than a half-century ago:

If a nation is to remain strong physically, mentally, spiritually, and socially, there must be education for fitness. Furthermore, this education must take place largely through the formal processes of physical education, health education, and recreation programs in our schools and colleges. Knowledge about the human body must be imparted, desirable health attitudes inculcated, and proper health practices instilled. The responsibility for accomplishing this Herculean task must be assumed mainly by physical educators, health educators, and recreation educators.^{49(p456)}

Although physical fitness and health have always had some part in physical education, they have not always been its primary focus. In fact, the main focus of physical education in schools has changed to reflect societal demands so

frequently that it has been referred to as the chameleon of all curricula.⁵⁰ Between the 1950s and 1990s, numerous curriculum models, including developmental education, humanistic education, movement education, kinesiological studies, play education, and personal meaning, have found their way into physical education,⁵¹ and these models still affect what is taught and how it is delivered. Irrespective of specific theoretical models, sport skill instruction (eg, for basketball, soccer, volleyball) has been the mainstay of most programs in secondary schools. Curriculum models that are currently popular include (a) Hellison's self-responsibility model,⁵² which focuses mainly on concepts such as teamwork, cooperation, self-responsibility, problem solving, and cultural awareness, and (b) Siedentop's sport education model,⁵³ which views sport as an important component of the American culture and is designed to prepare students to master diverse sporting roles (eg, as a player, coach, referee, trainer, reporter, manager).

Providing health-related physical activity is only one of the many goals of contemporary physical education, which also has expectations for children's motor skill, cognitive, social, and emotional outcomes.²⁸ Because it has so many objectives, physical education has been criticized as having a "muddled mission."⁵⁴ And because it is not feasible for students to accomplish all the proposed outcomes in the limited amount of time allocated for physical education classes, a number of professionals^{16,54} have promoted the concept of health-related physical education (HRPE). The main goal of HRPE is the development of lifelong physical activity, a concept aligned with public health objectives. Shifting to HRPE requires a redirection from fitness and sport skill training to motivating students to engage in physical activity during and outside of class time. This suggests that physical education should be an enjoyable experience during which students learn generalizable movement skills that will transfer into diverse activities, sports, and games offered at school, in the community, and later in life.

Not having a national physical education curriculum or national teacher certification standards¹⁹ perpetuates a cycle of disparate curriculum focus and teacher preparedness. An additional problem faced by physical education is that, even though it is a curricular area akin to mathematics and science, it is often confused with other school programs that contribute to children's physical activity (eg, recess, intramurals, interscholastic sports, and club programs). Unlike these other programs, however, physical education cuts across all school levels, is often required, and has defined educational objectives. Recess involves free play and is available only in elementary schools. Intramural sports (ie, competition among students/teams within the same school walls), interscholastic sports (ie, competition among schools), and active club programs are more common at secondary than elementary schools. These programs may help promote some of the objectives of physical education, but they do not reach all students. For example, interscholastic sport programs, which have a strong tradition in the United States, are usually limited to the most fit and highly skilled students. Programs for those in most need of physical activity for health purposes, such as the overweight, are often not available.

Not being able to distinguish itself from other activity programs places physical education at a disadvantage in terms of its legitimacy as an educational curriculum. Such marginalization has implications for the existence of policies that allow individuals without physical education teaching credentials to teach physical education in schools. In addition, because physical education is perceived as only one of several programs offering physical activity, its priority as a regular part of each school day is significantly reduced.

Globally, there has been a perceived decline in physical education offerings in schools since the 1970s,¹⁹ and it frequently has been described as being marginalized, including suffering from decreased curriculum time allocations, low subject status and esteem, and inadequate financial and personnel resources.⁵⁵ Parents do report that physical education

is important for their children and should be provided daily,⁵⁶ but there has been a general lack of support for physical education at the US federal level. The current No Child Left Behind (NCLB) Elementary and Secondary Act stresses accountability and achievement in core “academic subjects” such as reading and mathematics.⁵⁷ Similar to the “back to the basics” movement designed to reform education in the 1980s,⁵⁸ the NCLB omits physical education and health as part of the educational core. This results in unintended negative consequences for physical education, including reduced time and resources, state mandates for time not being met, and waiver programs exempting students from participating. As a result, physical education continues to have a diminishing role in the school curriculum.

The need for schools to provide and to promote physical activity is now far greater than during previous centuries when children accrued substantial amounts of physical activity through daily living. Some youths are at increased risk of having low levels of physical activity, particularly those from ethnic minorities (especially girls) and those with disabilities or living in neighborhoods where activity is restricted by safety concerns or inadequate facilities.^{12,15} Schools, unlike most other venues for physical activity, are in place to provide opportunities for physical activity regardless of children’s socioeconomic status, and most of them offer some physical education. If, however, as the American College of Sports Medicine (ACSM) slogan suggests, “Exercise is Medicine,” then “physical education is the pill not taken.”

There is need for more and for better quality state and national data on what is and what is not happening in physical education. Nonetheless, what is known suggests the need to address inadequacies. The California Endowment⁵⁹ recently indicated that there is an unprecedented need to reform physical education. Current data show that few children receive physical education at recommended amounts (ie, daily), and some receive none at all. Meanwhile, as we have highlighted, physical education

does not hold high status within school curricula, the quality of programs is sometimes concerning, and only a limited number of programs have a health-related focus. Reviews of interventions, however, indicate that physical education can be improved substantially, even within current time allocations, and there are some evidence-based programs available for dissemination. Making widespread changes to improve physical education, however, will require advocacy, policy actions, and strategic plans.

Improving Physical Education

There is hope for change. In 2007, for example, 12 states passed laws or resolutions, and another 22 introduced legislation dealing with physical education in schools.⁶⁰ The critical role that schools play in promoting student health, preventing childhood obesity, and combating problems associated with poor nutrition and physical inactivity has also been recognized by the US Congress. To formalize and encourage this role, Congress passed a law (P.L. 108-265) requiring local educational agencies that receive federal funds (ie, most schools) to establish a local school wellness policy by 2006. This legislation places the responsibility of developing wellness policies at the local level, and thus school districts must set goals for physical activity, nutrition education, campus food provision, and other school-based activities designed to promote student wellness. In addition, districts are required to involve a broad group of individuals in developing policies and to have a plan for measuring their implementation.

The US government, mainly through the National Institutes of Health and Centers for Disease Control and Prevention, has also recognized the need to design and test innovative physical education and other school programs that promote physical activity. Several of these have proven to be effective and are in the dissemination phase. In addition, numerous materials have been produced,⁶¹ including *Promoting Physical Activity: A Guide to Community Action*,⁶² which

devotes a chapter to social marketing and behavioral science that specifically targets schools. As well, the *School Health Index* has both elementary⁶³ and secondary⁶⁴ versions that consist of tools to help schools identify strengths and weaknesses of their physical activity and physical education policies and programs and to develop action plans for improving them.

Nongovernment agencies have also recognized the need to assist schools in promoting physical activity and have developed materials and recommendations to support best practices. For example, the National Association of State Boards of Education’s *Fit, Healthy, and Ready to Learn: A School Health Policy Guide*⁶⁵ provides sample policies designed to encourage physical activity and other healthy behaviors. In addition, the American Heart Association (AHA) recently released the scientific document, “Promoting Physical Activity in Children and Youth: A Leadership Role for Schools.”¹³ This document provides recommendations for school policies and practices for America’s schools relative to providing youths with the physical activity they need for lifelong health. We believe the following 4 AHA recommendations to be the most important in improving the quantity and quality of physical education provided in US schools:

1. Schools should deliver evidence-based health-related physical education programs that meet national standards to students at all school levels. These programs should provide substantial amounts of moderate to vigorous physical activity (eg, 50% of class time) and should teach students the motor and behavioral skills needed to engage in lifelong physical activity.
2. States and school districts should ensure that physical education is taught by certified and highly qualified physical education teachers at all school levels.
3. States should hold schools accountable for delivering physical education programs that meet national standards for quality and quantity (ie, 150 mins/wk for grades K-8). Specifically, each state should include physical education in its core educational accountability

system and should incorporate into its system national standards for curriculum and instructional quality.

4. Colleges and universities should provide professional preparation programs that produce teachers who are highly qualified to deliver evidence-based physical education and health education programs.

In summary, we have profiled physical education as it relates to physical activity, described its current status from both historical and contextual standpoints, and made recommendations for improving it. Nonetheless, even when provided daily, physical education by itself is not able to provide youths with all their recommended minutes of physical activity. Providing quality, mandated physical education should be considered as only one of many potential strategies for promoting children's physical activity. In addition, educators should consider redesigning the total school environment to provide students with more opportunities to be physically active. Achieving these goals will require substantial collaboration among many entities, including physical educators, school administrators, and school site and transportation planners. **AJLM**

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