Unlock Research
Research for Physical Educators

Research Report of the Month
JUNE 2003

The National Institute of Child Health and Human Development (2003).

Frequency and intensity of activity of third-grade children in physical education.

Archives of Pediatric and Adolescent Medicine, 157, 185-190.

The absence of individual author names in the reference above indicates that this is a large collaborative study, in this case engaging the efforts of 24 investigators from 20 universities and research institutes. The National Institute of Child Health and Human Development (NICHD) is part of the National Institutes of health (NIH), the biomedical research arm of the federal government. The NICHD Study of Early Child Care and Youth Development initially enrolled over 1,300 children at birth in 10 research sites throughout the United States. After the normal attrition of a decade, 1152 participants remain and the researchers have been conducting periodic observations and evaluations of many aspects of the children's lives as they progress from infancy through adolescence. Recruited in 1991, the cohort of children now has passed through the 3rd grade, and this study reports one aspect of what was happening when, as 9-year-olds, they attended physical education (PE) classes.

THE STUDY

This is a longitudinal study that presents a snapshot of children taken at a point nearly halfway on their journey from birth to physical maturity and young adulthood. The investigators' question: "What is the frequency and quality of school PE classes for this cohort of children, and how active are they in those classes?" was motivated by facts that now are familiar to almost everyone.

There is great cause for concern in the upward trends for obesity, type 2 diabetes mellitus, and lack of physical fitness among children, all of which are precursors of adult chronic diseases. The benefits of vigorous physical activity in reducing those trends have been well demonstrated. Accordingly, current national recommendations suggest that PE be offered daily and consist of lessons that engage children in moderate to vigorous physical activity (MVPA) at least 50% of class time. Given earlier studies suggesting that neither of those critical conditions often exist in public schools, it is not surprising that the NICHD Study Group was interested in what was happening in their participants' PE classes.

PARTICIPANTS AND CONTEXT

The children in the NICHD study do not represent a representative sample of children in the United States. They were purposefully recruited, however, so as to produce a sample that was deliberately made geographically, economically, and ethnically diverse. For example, the observed children attended 658 schools in 10 widely dispersed communities across the country. Within the participating cohort, 24% of the children represented ethnic-minority groups, 14% came from single parent homes, and the educational level of the mothers ranged from widely from 7 to 21 years.

In a like sense, the schools also were diverse with PE requirements ranging from 1 to 5 days per week, and class sizes ranging from 10 to 60 students (13 classes containing more than 60 children were excluded from the study, as were four with fewer than 10). Three quarters of the classes were taught at indoor locations (of highly variable nature), and 90% of the lessons were taught by PE specialists (the remainder having been led by untrained classroom teachers). The content of lessons also varied greatly, but was centered primarily in the categories of knowledge development, fitness activities, skill practice, and game play. Ultimately, 814 children were observed (414 boys and 400 girls) with 238 of the full study cohort not being included for reasons such as schedule problems, lack of teacher or parent permission, or, in the case of 21 children, because their school simply had no physical education at the third grade level.

DESIGN AND METHOD

Each child was observed by a single data collector throughout the length of one (entire) PE class. Using an automatic cueing system, the observer continuously alternated between 10 seconds of watching the child's activity level and the lesson context, and 10 seconds recording numeric codes that represented what they had just seen. For this, all observers had been trained and certified in use of a modified version of The System for Observing Fitness Instruction Time (SOFIT), a standardized instrument with well-established validity and reliability. The levels of activity recorded in SOFIT were 1, lying down; 2, sitting; 3, standing; 4, walking; and 5 very active. In the analysis of data, codes recorded as 4 and 5 were combined to produce a category that could represent the amount of MVPA. The recorded lesson contexts were categorized as management, knowledge, fitness activity, skill practice, game play, free play, or other.

RESULTS

As you can imagine, the substantial volume of collected data allowed inspection of a large number of variables and relationships – many of which are presented in the text and tables of the report. At the core, however, the analysis of data supports a small set of simple assertions. The children averaged 2 lessons per week, for a reported total of about 68 minutes of class time. Only 10% of the 814 had PE 5 times per week (the recommended frequency), with 30% scheduled once, 45% twice, 16% thrice, and 2.6% four times per week.

The average child was coded in the "very active" category for 4.8 minutes per lesson (out of the average lesson length of 34 minutes). When the time spent "walking" was added, the average child got about 12 minutes of MVPA per lesson – or 24 minutes from PE each week. If you prefer a different way of looking at the data, the 4.8 minutes of very active time per lesson represents 15% of the total time spent in each PE class.

There is a great deal more to learn from the detail contained in the original report – boys got a little more MVPA than girls, classes taught by trained PE teachers had a little more MVPA, outdoor lessons produced slightly higher levels of MVPA, and as class size increased, MVPA decreased – most of which would not surprise experienced elementary school PE teachers. Notwithstanding all of the interesting patterns that emerged, the bottom line remained implacably the same. Third grade PE for these children fell far below the national standards for frequency of classes and quantity of MVPA. Unless the average child was engaged in substantial vigorous activity outside of school hours, he or she would not be even within hailing distance of accumulating the 60 minutes per day that is widely regarded as the desirable level.

DISCUSSION

Most of the discussion in the report centers on the wide differences in requirements, class conditions, and observed MVPA across schools, districts, collection sites, and states – none of which will be considered here except to note that the authors clearly found that variability surprising, puzzling, and discomforting. Also, the investigative team did not elect to comment on their findings in any substantial way except to offer three straightforward observations:

1. More standardized requirements for PE would be desirable.
2. More efforts invested in staff and curriculum development will be required if the quality of PE classes (in terms of increased MVPA) is to be improved.
3. There is ample evidence from evaluation studies of existing intervention programs to assure that improvements can be produced (and that we can do so without fear of deleterious effects on students' academic achievement).

BEYOND THE STUDY

The following comments are entirely my own, are not endorsed by the NIH or NICHD, and are not necessarily shared by any of the members of the NCHD Study Group.

If taken as suggestions, the first of the authors' observations (above) seems more reflexive than thoughtful. There is ample material in this report to suggest that nobody pays much attention to either state or district regulations about required PE, or to recommendations from national groups for that matter! In the present educational environment, both regulations and recommendations are likely to constitute weak treatments.

The second observation is both more intuitively appealing and better supported by the existing research evidence (as noted in the authors' third observation). Staff and curriculum development interventions can and have produced solid (if not overwhelming) results. There is, in fact, a wish list of additional goals (all equally vital to progress) that the authors might have listed:

1. employment of more trained PE subject specialists,
2. better preparation of PE specialists for participation in the intensely political environment of the public school,
3. intensive training and support for classroom teachers when they must be used to teach PE,
4. improvement in workplace conditions in schools where environmental factors make it difficult or impossible for PE teachers to perform at the highest level of professional quality.

My instinct, however, is that these suggestions for remediation don't get to the right (or, at least, the first) question. What produced or allowed the things that the NICHD observers recorded? I can think of two points not mentioned in the report. First, teachers, administrators and educational policy-makers simply don't understand the terrible social and economic cost that will have to be paid for present levels of physical inactivity in preadolescent children – and until they do not much is going to change. Second, professional and governmental organizations are paying most of their attention (and resources) either to extolling the virtues of PE, or exhorting people about the need for more MVPA, and almost no attention to the reasons people have for not supporting PE in public schools, with or without more physical activity -- and until those are effectively addressed not much is going to change.

I don't know anything concerning ways to persuade people about health risks, but I do know a bit about what does and does not move people's opinions about physical education. The first rule is to weaken the reasons people have for not wanting better PE, that is, to address their concerns, before you spend all your resources on trying to convince them that they should want better PE.

A perfect example was noted in the report. There is good evidence that devoting more school time to PE does not weaken academic achievement. Among other sources, evidence from evaluation of the Sport, Play, and Recreation for Kids (SPARK) curriculum and teacher development project points to that conclusion. But how much effort has been expended on disseminating that message? How much resource muscle has been invested into SPARK replications that would allow parents, teachers, and legislators to see such results rather than just hear about them? To do those things would address a salient reason for not wanting to spend more school time on PE (or, art and music).

Another example is at least implicit in the report. What the observers saw at the data collection sites probably was directly experienced by most people who attended public schools and were subject to some form of PE at the elementary level. It is perfectly logical to anticipate that those people would have little faith in the proposition that more and better PE is going to accomplish anything very substantial. It is just not remembered as something intense, demanding, and firmly focused on specific outcomes. So passive if not active resistance to appeals about PE are to be expected. Yet it is possible to show people programs that completely undercut their assumptions about what PE can be like and can accomplish. How much money are your professional organizations spending this year to support replication of such programs and stringent, long-term follow-up evaluations?

Enough! Time to get off the soapbox. If you would like to get a word in edgewise, please start with the real source here – *The Archives of Pediatric and Adolescent Medicine, Vol. 157, February 2003*. Aside from unimportant (to me) statistics, the report contains nothing prohibitively technical, and is laid out in wonderfully user-friendly fashion. Read that brief and lucid account and then decide how you feel and, if you are so inclined, send me an e-mail.