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Physical activity, physical fitness or physical education: Are we betting on the wrong horse?

Professor Beth Hands, University of Notre Dame



If you read the daily newspaper, it is highly likely there will be an article on the importance of physical activity. A recent survey I undertook showed that on some weeks up to 25 articles with physical activity as a key word were published in mainstream Australian papers. A key word search of peer reviewed journals in Academic Search Premier reveals a similar pattern - with up to 30,000 articles having the word physical activity in the abstract. This is a relatively recent phenomenon. The number of published articles about physical activity related studies has grown astronomically compared to two other important terms, physical fitness and physical education. So why has this happened? Has this impacted on support for our learning area, physical education? In this article I will argue that we, as a community, have lost sight of one of the main reasons we need to be active (to build **physical fitness**) and do not adequately support a key pathway to lifetime physical activity (**physical education**). I suggest we are **betting on the wrong horse**.

Firstly, I shall define these three terms. Physical activity is defined as "any bodily movement produced by skeletal muscles that requires energy expenditure" (Casperson, Powell, & Christenson, 1985) and is generally measured as energy expenditure. For example, activities are generally described as sedentary, low, moderate or vigorous in intensity. On the other hand, physical fitness is "a set of attributes that people have or achieve that relate to the ability to perform physical activity" (Casperson et al., 1985). Elements of fitness are usually described as either skill-related (e.g. agility, balance, power, reactivity and speed) or health related (aerobic capacity, flexibility, muscle endurance, muscle strength and body composition). As an attribute, physical fitness is usually measured by field-based or clinical tests such as the shuttle run or sit and reach. Finally physical education aims to help students develop the skills, knowledge and attitudes necessary for confident, lifelong participation in sport and recreation activities. It may include areas such as health education, physical education, home economics, outdoor education, aquatics, sport and recreation.

The importance of physical activity

I am not arguing that physical activity is not important for our long term health and well being. There is much evidence to show that many health benefits are derived from an adequate level of physical activity including an increased **cardio-vascular fitness, stronger muscles and bones, weight maintenance**, a decreased likelihood of high blood cholesterol and Type 2 Diabetes Mellitus (T2DM) and reduced symptoms of anxiety and depression. However, you will notice that the bolded benefits are actually key elements of physical fitness.

The shift away from emphasising physical fitness to physical activity, particularly among children and adolescents, occurred late

last century after a series of papers led by Steven Blair, Charles Corbin and Thomas Rowland (Rowland, 1995). They proposed a lifetime physical activity model, with an emphasis on active play and daily physical activity designed to turn children on rather than off physical activity. Routine testing of fitness in children became politically incorrect as the tests were considered as "demeaning, embarrassing and uncomfortable to those children we are particularly concerned about - the sedentary lower 10%" (Rowland, 1995; p. 119).

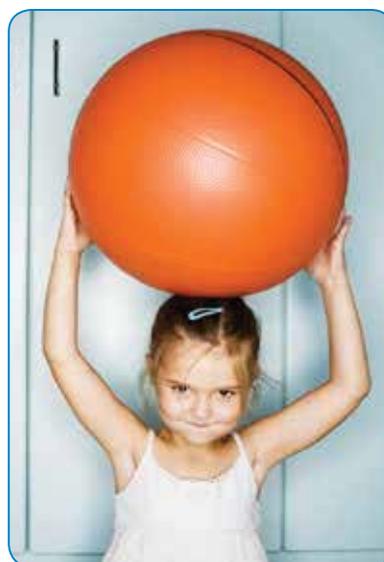
This change of focus to measuring the amount of daily physical activity, rather than fitness is now reflected in many school-based curriculum documents, state and federal policy documents and the current National physical activity guidelines. However among adults, Steven Blair has consistently demonstrated through numerous studies that being fit is much more important than being fat (Blair et al., 1996). He has shown that the death rate for thin and unfit people is at least twice as high as their fat yet fit counterparts. These aspects of fitness, in particular cardiovascular fitness (Blair et al., 1996) and muscle strength and endurance (Fitzgerald & Blair, 2004; Jurca et al., 2005) provide significant protection against early mortality. Low fitness kills more people than 'smokabiobesity'.

What about Physical Education?

Studies have shown that physical education develops skills (how to be physically active), knowledge (ways to be physically active and why), positive attitudes (the valuing of PA) and physical fitness in students (Hands report). As a mandated learning area, teachers assess and teach knowledge and skills to their students in safe, supportive settings. For many children, these lessons

are crucial. We know that movement skills do not automatically develop in children but must be taught and practiced and one of the most accessible ways for this to happen is in the PE classes. Children spend between 11 and 13 years in a school environment.

However, Physical Education programs around Australia have also been affected by the emphasis on physical activity. This is best



exemplified by the federal government initiative in 2004, the Active School Curriculum which required every school to include at least 2 hours of physical activity (not physical education) in a school week. This edict proved very difficult to monitor. In 2007, after a change of government, the initiative was withdrawn. It was then left to each State to recommend time allocations for physical activity and/or physical education, with very mixed results (Table 1).

Table 1. Recommended time allocations for physical activity or physical education by State

ACT	30 mins/day MVPA Yrs K-6 as part of PE and sport 150 mins/wk MVPA Yrs 7-10 as part of PE and sport
NSW	1.5 to 2.5 hrs/week PDHPE
NT	120 mins of PA/wk in school curriculum
QLD	30 mins/day PA Primary school 120 mins/wk PA Secondary school
SA	None
TAS	120 mins PA/wk primary and junior secondary school
VIC	20-30 mins/day Yrs P-3 PE 180 mins/wk Yrs 4-6 PE and sport 100 mins/wk Yrs 7-10 PE and 100 mins/wk for sport
WA	120 mins of PA/wk Yrs K- Yr 10 in school curriculum

While many acknowledge the important role of physical education in developing long term health in our children, it remains an under-resourced and an under-valued learning area. In 1992, a Senate Standing Committee determined *"there is no dispute about the importance of physical education, yet there is a serious problem with its delivery"*. As a result each State was charged with addressing this problem. For example, the Western Australian Government commissioned the House Report (1994) which resulted in a \$3 million dollar allocation to the Physical Steps initiative. However after 2 years, the funding was cut and many funded programs ended. In 1999, the Adelaide declaration determined Health and Physical Education should be one of 8 nationally agreed learning areas. However the 2009 Crawford report *The Future of Sport* lamented *"it was concerning to learn from experts Australia-wide that the education system no longer reliably provides the platform upon which much of the nation's sporting activity is based. It no longer consistently carries out the vital role of introducing children to physical activity and organised sport"*. Important recommendations from the report were that sport in schools should be a priority, that physical education should be a stand-alone learning area and the HPE National Curriculum was a priority.

Should we shift our focus back to physical fitness?

I would argue that we should for several reasons. First, physical activity is a behaviour that is difficult to measure and debate continues about what is sufficient physical activity. Whereas there are robust and validated measures of fitness in both the clinic and field this is not the case for measures of physical activity. Many questions remain unanswered. Is sufficient physical activity 60 minutes per day 7 days of the week or 5 days of the week? How much activity should be at a moderate intensity or at a vigorous intensity? Does it matter? What is the best measure of physical

activity? Steps per day? METs? Minutes per day? Is there a cumulative health benefits for short bouts of physical activity? Are our children sufficiently active?

Our State-based and National surveys of children's physical activity provide mixed results as each used different methods to collect the data and different formulae to interpret it. The National Children's Nutrition and Physical Activity survey used a computerised 24-hour recall over 4 days and determined physical activity levels according to a number of formulae. If sufficient physical activity is considered to be 60 minutes every day 32% met the guidelines, if 3 out of the 4 days sampled 58% met the guidelines and if averaged over the 4 days 82% met the guidelines. The NSW Schools Physical Activity and Nutrition Survey (2010) used a self report questionnaires to identify a significant decline in students' physical activity from 2004 (Hardy, King, Espinel, Cosgrove, & Bauman, 2010), with only 63% or less meeting the guidelines. Finally in Western Australia, sufficient physical activity was determined to be more than 60 minutes for 7 days of the week (Martin et al., 2008). Using self report questionnaires, 41.2% of primary school boys, 27.4% of primary school girls, 37.6% of secondary school boys and 10.1% of secondary school girls met these guidelines.

On the other hand, physical fitness can be measured more robustly. There are several sources of norms for determining acceptable levels of fitness among children such as the Australian Fitness Education Award (ACHPER, 1996). Consequently, we are able to develop more reliable and comparable information about the fitness status of our children. However fitness measures in our children are no longer being monitored at a population level. Unfortunately, similar to our physical activity surveys, there is some evidence that indicates our children are not becoming more aerobically fit (Tomkinson, Leger, Olds, & Cazorla, 2003). In 1985, baseline fitness levels of Australian children were collected as part of the ACHPER National Fitness Survey (Pyke, 1987). These data were used to inform the development of the Australian Fitness Education Award in 1994 (Walkley, Parker, & Jackson, 1996), when more data were collected to establish norms. A comparison of results showed that the fitness of children aged 9-18 years had declined over the decade. Since then cardio-respiratory fitness has been monitored at the State level in NSW using the 20 metre shuttle run (Hardy et al., 2010). In 2010, two thirds of children in years 4, 6, 8 and 10 were adequately fit. There was some evidence that the boys had become slightly fitter since 2004, but the girls had become less fit. We have no population level data on other aspects of children's fitness such as muscle strength, however this component of fitness is also very important during childhood and is acknowledged in our national physical activity guidelines for both children 0-5 yrs and 5-12 yrs <http://www.healthyschools.gov.au>.

Secondly, in a large cohort study, we found only a very weak association between physical fitness and physical activity (Hands, Larkin, Parker, Straker, & Perry, 2009), and a stronger link between physical fitness and motor competence. This is consistent with other studies (Trost, 2003) and very evident among children with low motor competence or inefficient fundamental movement skills. They are less physically fit (aerobic fitness, muscle strength, muscle endurance) than children with well developed skills (Hands, 2008). So we cannot assume that a physically active child will necessarily develop high aerobic fitness, strong muscles, a healthy weight and acceptable flexibility. Of course there are many other factors such as physical growth, biological maturation,



and environmental issues that must be considered. However, we can contribute to children's physical fitness by teaching, and providing opportunities to practice, a variety of motor skills as part of physical education programs from early childhood. Children who have developed proficient fundamental motor skills

are more likely to confidently engage in many activities and build their physical fitness.

To summarise, I am not suggesting we start to routinely test our children's fitness in schools but rather that we focus on these aspects rather than physical activity, when planning and delivering physical education programs or incidental physical activity opportunities.

Conclusions

1. Physical education needs to be well resourced by providing preservice and inservice teachers with appropriate, adequate and sustained professional learning and support from a variety of sources including politicians and political parties, bureaucrats of state and federal education ministries, the media and school leaders.
2. The importance of physical fitness, rather than simply physical activity, should feature in curriculum documents and school policy. I am not advocating the return of routine physical fitness testing nor daily fitness programs. Rather I would like to see an acknowledgement that physical fitness is an important outcome of school programs, in particular physical education.
3. A well designed PE curriculum should be allocated at least 150 minutes per school week. Currently time allocated to the learning area varies between schools, sectors and States. The Charter for Active Kids developed by the Western Australian based Children's Physical Activity Coalition includes 150 minutes per week of physical education as a key right for all children (<http://www.heartfoundation.org.au/SiteCollectionDocuments/CharterforActiveKids.pdf>).
4. Now is the time to invest in prevention. Quality Physical Education programs represent a critical outlay in the long term health of our children. Public health strategies and education policy need to reflect this importance. A recent analysis of physical activity minutes gained per day as a result of policy and environmental changes showed that mandatory physical education, active classroom breaks, and walking or riding to school accumulated 58 minutes (Bassett et al., 2013). Providing time for unstructured physical activity is not the same as providing meaningful and appropriate instructional time.
5. Physical activity guidelines need to include the importance of components of physical fitness, in particular aerobic fitness and muscle strength. These are already specified in guidelines developed by WHO (2004), Canada (2011) and USA (2012). The guidelines should also consider sex-specific recommendations accommodating the differing physical activity levels between males and females.

In 2010, Lloyd, Colley and Tremblay suggested that perhaps we are "riding the wrong animal". They proposed that a zebra better represents the concept of physical literacy, which is a multidimensional and interactive construct comprising physical fitness, motor competence, physical activity behaviour, and knowledge. Physical education, which can support children in building physical literacy, may be the elephant that underpins it all.

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