Fitness Testing for Children: Let’s Mount the Zebra!

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Childhood obesity has increased greatly over the past few decades, while children’s fitness levels have been declining worldwide.1-7 Physical fitness, is a multidimensional construct that includes skill and health related components of which cardiorespiratory fitness (CRF) and muscular fitness in particular are powerful determinants of health in youth.8 The association between fitness and health is well documented for CRF, whereby good CRF is protective against cardio-metabolic risk factors across BMI/fitness categories.9-11 Muscular fitness is also inversely associated with metabolic risk12 and is a valuable part of health monitoring in children.8 Specifically, poor muscular fitness is associated with elevated cardio-metabolic risk factors in adolescence9,12 and an increased risk of developing obesity;14 cardiovascular disease15 and with cardiovascular and total mortality.16 This effect appears independent of the associations between metabolic health and low CRF9,12.

Given such strong, independent associations between fitness and health, declines in pediatric fitness are worrying from a public health perspective and underpin the UK Chief Medical Officer’s (CMO) recommendation for routine fitness testing in schools.17 The CMO stated that “The introduction of a standardised school-based fitness assessment in England may have multiple benefits that extend beyond the benefits for the individual.”17 These benefits include: lowering the lifetime risk of 6 diseases, building a lifelong habit of participation in physical activity, higher educational achievement, maintaining a healthy weight, as well as improving social and mental wellbeing.18 Field-tests of fitness, such as Leger’s 20-m shuttle run test19 (or “bleep test,” “beep test,” “PACER,” “multistage fitness test”) used to estimate CRF, as well as hand grip strength, jump performance, and/or trunk muscular endurance to assess muscular fitness, particularly lend themselves to school-based assessments due to relatively low space and equipment requirements. More importantly, because they are often already, or can be easily integrated into Physical Education (PE) lessons. In part, the UK CMO’s recommendation for school-based fitness testing builds upon a variety of well-reported school-based fitness projects, and the wealth of information that these have yielded. For example, the FITNESSGRAM fitness testing battery is implemented annually in a number of US states20 and in New York City public schools,20 while the ALFHA fitness testing battery based on the pan-European HELENA and Spanish AVENA studies has been successfully piloted in Spanish schools.21 In the UK, in addition to being implemented sporadically in schools,22 youth fitness testing is implemented regularly by fitness professionals in conjunction with academics from Liverpool John Moores University, as part of the on-going research and health promotion program: SportsLink.3

More recently, our group from the University of Essex launched the East of England Healthy Hearts Study, which included comprehensive fitness testing for 10- to 16-year-old children during PE classes at schools in London, Essex, Suffolk, and Bedfordshire (UK counties). The study allowed for the development of various fitness test norms24-26 and revealed declining trends in fitness27-4 and a number of mediating factors.27-30 Furthermore, the Texas Youth Study based on fitness assessment of over 2.5 million children revealed positive associations between fitness and academic achievement, school attendance, several psychosocial measures and negative associations with indicators of delinquency.31 While much of these data are not new, one should not ignore the potential value of media coverage of these physical and cognitive or behavioral correlates of fitness and highlighting regional differences32 as leverage to promote governmental action on physical activity (PA).31

While few would argue against the value of monitoring trends in children’s health, routine school-based fitness testing is not greeted with approval by all. The Association for Physical Education and parent groups criticized such plans for the UK, echoing concerns about fitness testing in children aired in the academic literature.31,33 One specific concern is the potential for fitness testing to be an unpleasant and embarrassing experience for overweight children,34 one that might reinforce poor physical self-concept. While there is little empirical research examining children’s experience of fitness testing is under-researched,35 there is indeed some evidence to suggest that there may be negative psychosocial consequences, such as embarrassment or teasing by other children.36,37 Since physical self-concept is a determinant of PA,38 this is indeed an important concern for school-based fitness testing. In addition, fitness testing has also been criticized for not promoting PA per se;21 yet even its strongest advocates do not regard this as an expected outcome of the process.32 For example, the National Child Measurement Program, which assesses BMI in UK schoolchildren, does not cite weight loss as an objective of the measurement process but rather “to inform local planning and delivery of services for children.”39 Another important point for consideration, and one which has previously been alluded to in attempts to advance the debate around fitness testing for children, is that while assessment of academic progress is almost universally accepted, there remains strong resistance to school-based health and fitness assessments.40

Fitness Testing as a Zebra

Based on the aforementioned concerns, as well as additional concerns regarding fitness tests validity, use of criterion standards13 or inappropriate use of data,41 a number of authors have challenged the value of youth fitness testing and likened it to a dead horse,41 from which “it is time to dismount.”42 Other authors, in keeping with the metaphor of a horse, have defended youth fitness testing, asserting that its value depends on the skill and training of the riders.