Invited Paper

It's Time to be More Serious About Activating Youngsters: Lessons for Childhood Obesity

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The epidemic of obesity is impacting an increasing proportion of children, adolescents and adults with a common feature being low levels of physical activity (PA). Despite having more knowledge than ever before about the benefits of PA for health and the growth and development of youngsters, we are only paying lip-service to the development of motor skills in children. Fun, enjoyment and basic skills are the essential underpinnings of meaningful participation in PA. A concurrent problem is the reported increase in sitting time with the most common sedentary behaviors being TV viewing and other screen-based games. Limitations of time have contributed to a displacement of active behaviors with inactive pursuits, which has contributed to reductions in activity energy expenditure. To redress the energy imbalance in overweight and obese children, we urgently need out-of-the-box multisectoral solutions. There is little to be gained from a shame and blame mentality where individuals, their parents, teachers and other groups are singled out as causes of the problem. Such an approach does little more than shift attention from the main game of prevention and management of the condition, which requires a concerted, whole-of-government approach (in each country). The failure to support and encourage all young people to participate in regular PA will increase the chance that our children will live shorter and less healthy lives than their parents. In short, we need novel environmental approaches to foster a systematic increase in PA. This paper provides examples of opportunities and challenges for PA strategies to prevent obesity with a particular emphasis on the school and home settings. [*J Exerc Sci Fit* • Vol 7 • No 2 (Suppl) • S28–S33 • 2009]

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Introduction

The global explosion in childhood obesity has reached epidemic proportions and is projected to increase further (Wang & Lobstein 2006; Zaninotto et al. 2006), with the increased prevalence consistent with reductions in physical activity (PA). Despite the contention that leisure-time PA has remained constant in some settings, habitual levels of PA have declined in most societies (Brownson et al. 2005).

As a chronic condition, obesity is also a major contributor to the global burden of chronic disease and disability and is associated with increased risk of comorbidities including type 2 diabetes, cardiovascular disease, hypertension, stroke, and most forms of cancer (Guh et al. 2009; Haslam & James 2005). Poor diet, often in combination with a sedentary lifestyle, further increases the likelihood of many of these health problems, independent of body weight (Ludwig & Pollack 2009). The maintenance of a healthy body weight and composition has important implications for the prevention of the large disease burden in the future.

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In simple terms, the etiology of obesity can be attributed to an energy imbalance over time where energy intake consistently exceeds energy expenditure. The common dietary pattern which promotes over-consumption includes low-quality carbohydrates and fats, and energy-dense foods (high in saturated fats and sugars) with poor satiety value. Consistent with changes in energy consumption, PA energy expenditure has declined and many children today spend a significant proportion of their time in sedentary pursuits. Despite the susceptibility of people at any stage in life, the increasing global prevalence of child and adolescent overweight and obesity is of particular concern. It has also been postulated that the true prevalence of childhood obesity is higher than reported (Katz 2009), with the number of very young obese children increasing rapidly (Kim et al. 2006). In short, the nature of the present-day environment encourages an inactive lifestyle which contributes to positive energy balance and childhood obesity (Hills et al. 2007).

An increasing number of PA intervention studies have been undertaken in the context of childhood obesity prevention (Lobstein et al. 2004); therefore, much of the learning stems from this work. Most experts (Katz 2009; Wofford 2008; Salmon et al. 2007) agree that effective PA interventions across multiple sectors are urgently required to address childhood obesity. This paper focuses on the importance of harnessing the capacity of the populace, including parents, teachers, health professionals, policymakers and politicians, to influence the knowledge, attitudes and behaviors of young people to improve body composition status and health outcomes.

PA and Growth

PA and nutrition are key factors with the capacity to influence growth and the development of body fat, skeletal muscle tissue and bone during childhood and adolescence. During the growing years, level of PA participation and nutritional status influence health status and in turn, changes in components of fitness are influenced by growth and maturation (Hills et al. 2007). However, it is difficult to separate the specific effects of regular PA on health and fitness status from the adjustments in growth and development during childhood and adolescence (Hills 1995). It is important to highlight that appropriate nutrition, ideally in combination with PA, is essential for normal growth and development; however, growth and maturation will continue despite low levels of PA (Malina 2000). It is logical to suggest that young people who experience optimal nutrition and participate in regular PA during the formative years will be more likely to display healthy patterns of physical maturation consistent with their genetic potential (Hills et al. 2007). Alas, we know that the environment exerts a strong influence on PA (Dollman et al. 2005) that is sufficient to undermine the opportunity for many children and adolescents to be physically active.

Obesity Susceptibility and Environmental Factors

Genetic factors account for individual variability in size and shape and also contribute to the susceptibility or predisposition of an individual to gain weight. However, the obesity epidemic is the result of a constellation of relatively recent environmental changes including eating and activity behavior patterns (Zimmet & James 2006). Broadly speaking, the worldwide epidemic has been fuelled by rapid and sustained economic growth, modernization and urbanization, plus the globalization of food markets, in combination with significantly less PA in all sectors (Ludwig & Pollack 2009; Brownson et al. 2005).

A plethora of environmental factors have helped to "engineer" PA out of the lifestyle behavior repertoire of many people (Chakravarthy & Booth 2004) and contributed to the global increase in childhood obesity. The level of habitual PA observed in a large proportion of young people is dangerously low in many societies and there are overall reductions in total energy expenditure. Additionally, participation in formal or planned exercise is lower than desirable. This phenomenon relates to the fact that exercise in the traditional sense has never been on the radar of many overweight and obese youngsters. Akin to the concept of size and weight acceptance, low levels of PA (and energy expenditure) have become the "new normal" or habitual level.

PA can prevent and treat a wide range of physical and psychological disorders (Sallis et al. 2006). In contrast, low habitual PA energy expenditure in the obese contributes to an escalation of poor health status which worsens through childhood and adolescence and adulthood without intervention. It should be remembered that physical health is compromised in obese children similarly to adults (Katz 2009). Physical inactivity contributes to substandard health-related fitness and reduced self-efficacy in obese children. Quality of life may also be severely compromised (Tsiros et al. 2009;

Schwimmer et al. 2003). A viable strategy to impact the progression of childhood obesity in an obesogenic environment which fosters overnutrition and physical inactivity is to decrease sedentary behaviors, support participation in more lifestyle PA, and challenge the minimal activity levels of youngsters and their parents.

Despite the increasing body of research on the role of sedentary behaviors on obesity and other chronic conditions, this is not a particular focus of the present paper. There is much less evidence on the relationships between the use of screen-based media and health than PA and health (Iannotti et al. 2009). However, logic suggests that positive outcomes would stem from increasing PA and decreasing sedentary behaviors. Indeed, nationally representative samples of youth in two countries have recently provided evidence of the positive physical and social concomitants of PA and corresponding negative concomitants of screen-based media (Iannotti et al. 2009).

PA Promotion in Children and Adolescents—Implications for Obesity

Current research evidence regarding the effectiveness of PA promotion strategies in children (Wofford 2008; Giles-Corti & Salmon 2007; Salmon et al. 2007) is weak or inconclusive. In most cases, PA level and/or energy expenditure has not been assessed. However, recent reviews have consistently suggested that the most effective interventions in childhood and adolescence (van Sluijs et al. 2007) involve multiple components across a range of settings including the school, home and wider community (Giles-Corti & Salmon 2007). The most effective PA interventions for children have been delivered in the school setting with emphases on physical education, activity breaks during the school day, and the involvement of families (Salmon et al. 2007). For adolescents, the most effective PA interventions may include primary care settings and individualized counseling (Huang et al. 2009).

Kropski et al. (2008) claim that it is difficult to be conclusive regarding the efficacy of school-based obesity prevention approaches, mainly due to the small number of studies and concerns regarding methodology. However, despite the controversy regarding the utility of school-based approaches, this should not be used as an excuse for inaction. As Yach et al. (2005) have stressed, action need not wait until evidence of the effectiveness of PA interventions is available. Similarly, Katz (2009) contends that despite the limited evidence, there is an urgent need to take action for both obesity and type 2 diabetes. Other recent reviews (Doak et al. 2009; Oude Luttikhuis et al. 2009) also suggest that future research should include longer and more intense interventions, stronger methodologies, and greater consideration of sustainability and generalizability. In addition, many interventions have failed to use objective measures of PA and relied on self-reported and/or proxy measures and failed to evaluate outcomes (Salmon et al. 2007). In the knowledge that choice of measurement tools for PA and obesity interventions can be challenging, we have recently developed approaches to guide decision-making in this area (Dollman et al. 2009).

Most importantly, there is a need for studies to incorporate high-quality evaluation protocols (Kropski et al. 2008), consider measures of fidelity, dose (delivered and received), reach, recruitment, and context. Studies should also follow standard guidelines (Giles-Corti & Salmon 2007; Des Jarlais et al. 2004) in reporting results of evaluations (Salmon et al. 2007). Without this information, it is difficult to determine why an intervention succeeded or failed.

PA and Obesity Interventions—Best Bets?

A significant impediment to the optimization of body composition and health status of children and adolescents may be the failure to acknowledge (and/or understand) the central role of PA and exercise in weight management (Hills & Byrne 2006). There is a fundamental problem if PA and exercise are considered inconvenient rather than a central component of one's lifestyle. This scenario has contributed to an exacerbation of the obesity problem and a magnification of the challenge of behavior modification (Lees & Booth 2005). Another example relates to the standing given to appropriate nutrition education and PA in the school setting.

Evidence from recent adult studies provides a sound basis for work with young people. For example, Pan et al. (2009) identified the importance of tailoring PA promotion strategies to enhance individuals' confidence to engage in PA, to motivate people to be more active, and to educate them regarding the health benefits of PA. Fundamental to success will be the ability to reduce barriers to PA, and to address gender- and ethnic-specific issues and different socioeconomic groups. To make significant inroads in the prevention and management of obesity, previously mainstream PA opportunities must be re-established along with new and

innovative approaches to encourage children to decrease inactive, sedentary behaviors (Katz 2009; Katz et al. 2008).

To achieve population change in PA, multilevel interventions are required (Sallis et al. 2006) and should be based on ecological models which target individual, physical and social environments, plus policies. As PA is closely intertwined with education, transport, health and planning, a multisectoral approach is needed (Fox & Hillsdon 2007). It is also worth noting that PA promotion is a relatively new discipline; therefore, we should gear up to a longer rather than short-term challenge (Yach et al. 2005). Significant responsibility for the provision and delivery of PA opportunities at the community level rests with policymakers and politicians (Ludwig & Pollack 2009; Colagiuri 2007; Schmid et al. 2006; Zimmet & James 2006; Yach et al. 2005). However, equally important are the reinforcement of these opportunities and the collective responsibility of parents, teachers, health professionals and young people themselves. In summary, there is little chance that individual responsibility will be optimized unless government and the private sector work together to encourage and support individuals who make healthy choices (Yach et al. 2005). It is also critical that PA becomes part of a more comprehensive set of solutions to the obesity problem rather than being viewed in isolation (Fox & Hillsdon 2007).

School setting

For a period of time, we have been prepared to endorse the importance of PA based on increasing evidence of the numerous benefits for children. Despite this, we have reduced PA opportunities for children, including in the school setting. Therefore, we could argue that schools are part of the problem and also a big part of the solution (Katz 2009). Despite the benefits of physical and health education in the school setting, opportunities have severely contracted in many parts of the world (Ludwig & Pollack 2009). The same is true for other PA opportunities during the school day, including after-school PA and sport. Excuses given for reductions in PA in the school setting include lack of space in the curriculum, perceived safety problems, and lack of qualified teaching staff. All children and adolescents should be actively encouraged rather than discouraged to move at every opportunity during the school day.

There are numerous examples of quality school-based intervention programs with a demonstrated capacity to improve the health and weight status of children. These include CATCH and Planet Health (Franks et al. 2007), and recent school-based PA (Katz 2008) and nutrition programs (Katz 2006). The potential for success of any intervention may, in large part, be associated with school and research staff working together in a participatory research approach (Katz 2009).

Timperio et al. (2004) underlined the importance of engagement with the whole family in school-based interventions for children. Despite the best approach, any inconsistency between the within and out-of-school environments is likely to be counterproductive and a significant opportunity lost (Katz 2009). Unfortunately, there is often limited overlap between educational practices in the school and home settings. A shortcoming of many interventions to date has been the misconception that we only need to provide education to effect a change in eating and activity behaviors. However, education must be combined with assistance to facilitate behavior changes in a supportive environment. This should include children, parents and teachers working together.

School-based interventions may also need to target boys and girls using different techniques and approaches (Kropski et al. 2008), where possible including other family members. More research is needed on after-school programs given the potentially cost-effective and time-efficient opportunity to increase PA levels at these times (Pate & O'Neill 2009), ideally by engaging with parent(s) and/or other family members. Active transport to and from school has also been mooted as an important opportunity to increase PA levels in children and adolescents (Yeung et al. 2008). Safety in numbers would dispel many of the perceived dangers associated with children and active transport (Fox & Hillsdon 2007).

Pratt et al. (2008) recommend that a better understanding of the influences on children's diet, PA and obesity is required. Similarly, there is increasing recognition that weight management strategies in the school setting should use combined nutrition and PA approaches to be more effective (Katz 2009; Katz et al. 2008).

Home setting

In the home environment, parents should be actively engaged in a wide range of physical activities with their children. To achieve this goal, structural and environmental changes will be necessary to support and maximize PA participation. Logically, parents will also need to be provided with education strategies to better understand the consequences of obesity, making healthy food and activity choices, and behavioral change strategies (Waters & Baur 2003). Supportive policies and

environments in the settings in which children and families spend most of their time (child care, school, home, workplaces and local neighborhoods) are also needed. Adequate free time for PA, by prioritizing this during the school day, is essential (Waters & Baur 2003).

Summary

Due to the shortcomings of research to date, there is an important need to generate further evidence regarding the efficacy and sustainability of multilevel, multicomponent PA interventions for children with a focus on family, school (including after school) (Pate & O'Neill 2009) and community settings (Salmon et al. 2007; van Sluijs et al. 2007). Novel and sustainable approaches are needed in all settings to foster a systematic increase in PA in the wider community. However, such approaches must be paralleled by significant policy reforms to address an environment that "increasingly promotes poor nutrition and physical inactivity" (Ludwig & Pollack 2009).

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