

Physical activity for children: what are the US recommendations?

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Summary

Data from three US nationwide surveys, the Pediatric Nutrition Surveillance System (PedNSS), the Third National Health and Nutrition Examination Survey (NHANES III), and the Practice Partner Research Network (PPRNet), have found that obesity is steadily increasing among American children. At the same time, statistics indicate that children and adolescents are becoming more inactive, especially as they get older. Childhood obesity and physical inactivity have similar health risks that can ultimately lead to serious health consequences. Moderate physical activity is recommended for everyone. Physical activity should include aerobic fitness, muscle strength, and endurance, as suggested by national policy. The Kid's Activity Pyramid is a teaching tool for health care professionals, educators, parents, and children themselves, to be used to encourage daily physical activity. Children need to be on the move every day to develop and maintain strong bones and muscles and sustain a healthy weight.

Keywords: adolescent, children, obesity, physical activity, physical fitness

Physical activity in American children

Children need to be physically active every day. The *Year 2000 Dietary Guidelines for Americans* recommend choosing a lifestyle that combines sensible eating with regular physical activity. Children should be a healthy weight and be physically active at least 60 min each day to promote optimal growth and development and to reduce the risk of chronic disease (Johnson 2000).

Unfortunately, nearly 50% of US children aged 12–21 years do not participate in vigorous activity on a regular

basis (Surgeon General 1996), and as children get older, their participation in physical activity declines (Dovey *et al.* 1998). Health statistics released by the US Centers for Disease Control and Prevention (CDC) indicate that 69% of children aged 12–13 years reported that they regularly participate in vigorous physical activity compared to 38% of children aged 18–21 years (CDC 2000). Results from the Dunedin Multidisciplinary Health and Development Study (Dovey *et al.* 1998), a longitudinal cohort study conducted in New Zealand, indicated a 37% reduction in total time spent in physical activity in children from the age of 15–18 years. Furthermore, the amount of time spent in physical activity on average decreased approximately 3 hours/week for females and nearly 4 hours/week for males over this 3-year period. In addition, data from the US National Youth Risk Behavior Survey indicated that the percentage of high-school students participating in daily physical education classes decreased from 42% in 1991 to 27% in 1997 (CDC 1997a).

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Health risks of physical inactivity

Physical inactivity has a strong association with a number of chronic diseases. Health risks associated with physical inactivity include coronary artery disease (Siscovick *et al.* 1985), blood lipid disorders (Alpert & Wilmore 1994), type II diabetes (Siscovick *et al.* 1985), osteoporosis (Siscovick *et al.* 1985; Anderson 2000; NIH 2000), and obesity (Moore *et al.* 1995). Children are becoming fatter and are less active (CDC 1997a). The Framingham Children's Study (Moore *et al.* 1995) found that preschool children with low levels of physical activity were nearly four times more likely to gain subcutaneous fat than active preschool children.

US childhood obesity on the rise

US nationwide surveys, conducted between 1976 and 1994, indicate that the prevalence of overweight children has significantly increased (Troiano & Flegal 1998). The increase in overweight children has been observed in children as young as 2 years of age. Data from the Pediatric Nutrition Surveillance System (PedNSS) found that the proportion of children aged 2 to 4 years who were overweight, had steadily increased from 7.0% in 1989 to 8.6% in 1997 (CDC 1997b).

Results from the Third National Health & Nutrition Examination Survey (NHANES III), conducted in the US from 1988 to 1994, found that over 10% of children aged 6–12 years were classified as overweight (Sokol 2000). Among adolescents aged 12–17 years, the survey indicated that at least 20% were classified as overweight and, of those overweight adolescents, 8–17% were classified as obese. More recently, the Practice Partner Research Network (PPRNet) primary care practices (Gauthier *et al.* 2000) conducted a survey from 1995 to 1997. Children aged 6–19 years, from 49 nationwide PPRNet primary care practices, were enrolled in the study. Results from the survey found one in three children and adolescents to be at risk of being overweight, and one in seven children and adolescents were overweight. It was concluded from this study that the prevalence of overweight or the risk of being overweight among children and adolescents was greater in the PPRNet Study than the NHANES II and III Studies. A true comparison of data between the studies, however, could not be determined because of differences in the subject sampling methods (Gauthier *et al.* 2000).

Health consequences of childhood obesity

Obesity during childhood can have serious health consequences. Childhood obesity has been associated with risk factors for cardiovascular disease, such as elevated blood pressure and abnormal lipoprotein levels (Freedman *et al.* 1999; Must & Strauss 1999), orthopaedic abnormalities, pulmonary disturbances such as asthma and sleep disorders, gallstones, and insulin resistance (Must & Strauss 1999). Although there are many factors that contribute to the aetiology of obesity, people who are unable to balance their energy needs, consuming more calories than they expend, accumulate fat stores (Epstein *et al.* 1996; Rippe *et al.* 1998). One factor that contributes to US children's energy imbalance is the amount of time they spend watching television. Approximately one-quarter of US children watch four or more hours of television/day and more than two-thirds watch at least 2 hours/day (Andersen *et al.* 1998). Children who watched four or more hours of television/day had a greater body mass index (BMI) than children who watched less than 2 hours/day (Andersen *et al.* 1998). For many children, simple tasks such as turning on the television, VCR or stereo, can all be done by the push of a button without moving from their chair. Children no longer need to walk across the street to talk or play a game with a friend; they can do it all over the Internet!

Physical and behavioural health benefits of physical activity

Children think of physical activity as fun (Borra *et al.* 1995). If given the opportunity and encouraged, most children will choose to be active (Corbin *et al.* 1994). Results from the 1995 Gallup survey found that most children knew that physical activity was important for good health and they were interested in increasing their level of physical activity. In fact, 8% of the children surveyed said they wanted to be more physically active (Borra *et al.* 1995).

Regular physical activity during childhood and adolescence has physical and behavioural health benefits. Physical health benefits include controlling weight (Klesges *et al.* 1995; Moore *et al.* 1995), increasing muscle strength and endurance (Rowland 1990), building healthy bones (NIH 2000) and muscles (Rowland 1990), and lowering the rate of the age-related increase in blood pressure (Shea *et al.* 1994). An additional health benefit of physical activity was observed in children at risk for cardiovascular disease. An 8-week study

(Harrell *et al.* 1998) of third and fourth graders at risk for cardiovascular disease divided subjects into one of three groups; the control group, or one of two intervention groups. The intervention groups participated in a physical activity programme that included aerobic activities three times/week and classroom nutrition instruction two times/week. Children enrolled in the intervention groups had a decrease in cholesterol, blood pressure and body fatness, as well as an increase in their health knowledge as compared to the control group. Likewise, Alpert & Wilmore (1994) reviewed several studies on the relationship between physical activity and blood pressure and found a reduction in blood pressure for the hypertensive adolescent after exercise.

Physical activity among adolescents has also been correlated with behavioural health benefits (Boyd & Hrycaiko 1997), such as increased self-esteem and lower levels of anxiety and stress (CDC 1997a). An example of this was observed in a British cohort study (Steptoe & Butler 1996) that followed 5000 children over a 16-year period. Over that time, the study found a positive association between adolescents participating in vigorous sport and recreational activities and their emotional wellbeing.

What are the US recommendations for children's physical activity?

Children should choose activities that they enjoy and that can become part of their daily routine. Every day, children should participate in a variety of physical activities, such as active play, walking, bicycling, dancing, organised sports, or even doing household chores. Active children who are involved in a variety of activities appear to have enhanced physical fitness (Sallis *et al.* 1993; Sallis & Patrick 1994). Physical activity should include aerobic fitness, muscle strength, and endurance, and flexibility (Corbin *et al.* 1994); however, physical activity does not need to be strenuous to have beneficial effects. Moderate physical activity performed regularly is recommended for people of all ages (Surgeon General 1996; CDC 1997a; US DHSS 2000). Examples of moderate activity include walking 2 miles or riding a bike 5 miles in 30 min, jumping with a skipping rope for 15 min, or playing basketball for 15–20 min (Surgeon General 1996; CDC 1997a). Continuous exercise at moderate or high intensity, however, depends on the chronological as well as the biological age of the child, because not all children develop and mature at the same rate (Maffulli 1998).

One goal of *US Healthy People 2010* is to improve

the health, fitness and quality of life for Americans through daily physical activity. To meet this goal of *Healthy People 2010*, it is suggested that US adolescents achieve two objectives. The first objective is to increase the proportion of adolescents who engage in moderate physical activity for at least 30 min on five or more of the previous 7 days. The second objective is to increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness three or more days/week for 20 min or more on each occasion.

The *Kid's Activity Pyramid* (Park Nicolet 1997; Fig. 1) identifies physical activities to promote for children, as well as the sedentary activities to limit. Healthcare professionals, parents, educators and other childcare providers can use the *Kid's Activity Pyramid* as a teaching tool along with the recommendations established by various US government agencies (Johnson & Kennedy 2000; Surgeon General 1996; CDC 1997a; Corbin *et al.* 1994; US DHSS 2000), which encourage children to be physically active every day. The *Kid's Activity Pyramid* encourages children to participate in physical activity with friends, parents or by themselves. Children should participate in intense activities that have aerobic effects, such as swimming, inline skating (rollerblades), soccer or volleyball, 3–5 times/week. They should undertake leisure activities, such as brisk walking, tennis or softball, and stretching and strengthening activities, such as push-ups and sit-ups, 2–3 times/week (Park Nicolet 1997; USDA 1998). Sedentary activities, such as television viewing and playing sedentary video/computer games should be limited, based on the current evidence that suggests these low-level activities are associated with increased body fatness (Andersen *et al.* 1998).

Children and adolescents who perform weightbearing exercises improve their bone mineral density while reducing the risk of osteoporosis later in life (Faigenbaum *et al.* 1999; Rowland 1990; Surgeon General 1996). Faigenbaum *et al.*, however, observed that children performing more repetitions with moderate weight improved their muscle endurance and strength better than lifting heavy weights with fewer repetitions. Athletes that have not reached physical maturation should avoid the practice of weightlifting, powerlifting, bodybuilding and repetitive use of maximal amounts of weight in strength training (AAP 1990a).

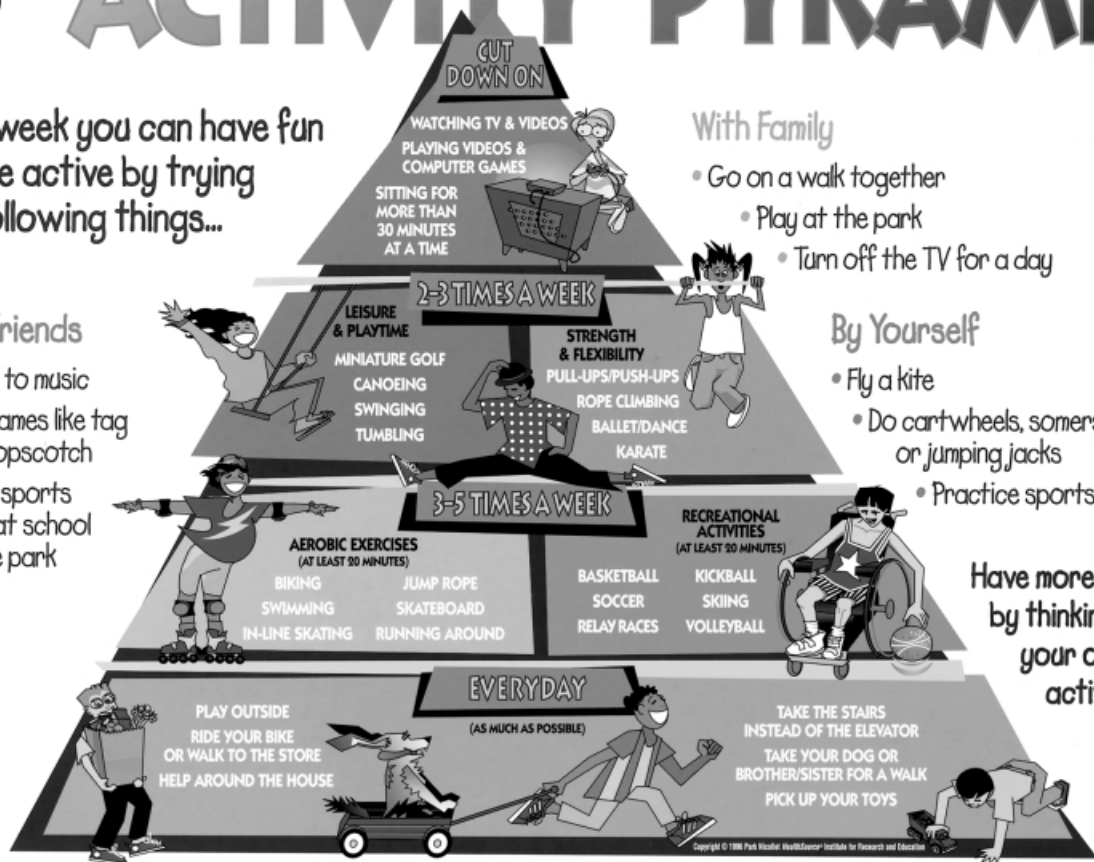
Participation in team sports should wait until the age of 6 years (AAP 2000a). Until this time, children are unable to understand the concept of teamwork. Participation in a variety of sports should be encouraged,

THE kid's ACTIVITY PYRAMID

Each week you can have fun and be active by trying the following things...

With Friends

- Dance to music
- Play games like tag and hopscotch
- Join a sports team at school or the park



With Family

- Go on a walk together
- Play at the park
- Turn off the TV for a day

By Yourself

- Fly a kite
- Do cartwheels, somersaults or jumping jacks
- Practice sports skills

Have more fun by thinking up your own activities!

Figure 1 The Kid's Activity Pyramid. Copyright ©1997 Park Nicollet HealthSource® Institute for Research and Education. Reprinted by permission.

rather than specialisation in a single sport (AAP 2000b). Choosing a variety of physical activities enhances the development of many skills and decreases the potential risks of intense training. Caution should be exercised if very young children want to participate in distance running and/or intensive training. Distance running and intensive training in children may have adverse short-term and long-term consequences. Policy statements issued by the American Academy of Pediatrics (AAP 1990b) state, 'endurance running may induce musculoskeletal, endocrine, haematological, thermoregulatory, and psychosocial damage. Most reports on these risks have not been evaluated using proper epidemiological scrutiny and it is unknown whether the risk is greater for children than for adults'. Intensive training may depress myocardial function and sexual maturation in girls, or induce musculoskeletal injury and growth disturbances, heat stress, psychosocial problems and poor nutritional status, especially for iron and calcium

(AAP 2000b). Reports concerning the potential risk of endurance running for various ages are not available. Therefore, The American Academy of Pediatrics recommends that, if children enjoy distance running events and are asymptomatic, there is no reason to preclude them from training for, and participating in, events (AAP 1990b). Child athletes involved in intense training need be monitored regularly by a paediatrician and ongoing assessment of nutritional intake is imperative. Further recommendations for intensive training and sport specialisation in young athletes are outlined in the American Academy of Pediatrics' policy statement (AAP 2000b).

Conclusion

The risks associated with physical inactivity and the benefits of physical activity are well documented. The rate of childhood obesity in the US has risen to an

epidemic level. Parents and adult caregivers should be instrumental in encouraging their children to be physically active. Parental support influences the frequency and intensity of children's physical activity (Biddle & Goudas 1996). Schools and communities, along with parents, have the potential to improve the health of children by increasing children's activity level through physical education. The *Guidelines for School and Community Programs* to promote lifelong physical activity among young people (CDC 1997a) outline physical activity policy recommendations and addresses parental involvement, community health services, and community sports and recreation programmes for young people.

Children and adults need to be on the move to strengthen bones, build lean body mass, and maintain a healthy weight. As stated in the *Physical Activity and Fitness Research Digest* (Surgeon General 1996), 'by making the relatively small change from an inactive lifestyle to one that includes moderate but regular physical activity, even the most sedentary Americans can prevent disease and premature death and improve their quality of life'.

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