

Technological Media and Sedentary Behavior in Pediatrics

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ABSTRACT

Children between the ages of 8–18 spend 5–10.5 hours each day engaged in sedentary technological media. This recent cultural shift has left children with little time for unstructured play or physical activity and has been directly correlated to an increase in chronic, non-communicable diseases. This article addresses the effects of a sedentary lifestyle on health outcomes for children and adolescents in America, reviews physical activity guidelines, including national policy, and discusses effective strategies for Pediatric Nurse Practitioners for the health promotion of physical activity through a family, school, and community focus.

Keywords: physical activity, sedentary behaviors, sedentary technological media, strategies

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Sedentary behavior is strongly associated with time spent engaging in sedentary technological media.¹ Sedentary technological media includes television, video games, and computer screen time (ie, iPods, tablets, smartphones, and social media).¹ It is critical that pediatric nurse practitioners (PNPs) and other pediatric health care providers become aware of how sedentary technological media impacts pediatric health outcomes. The increased use of sedentary technological media among children has resulted in increased levels of sedentary behavior. Although PNPs are likely aware that children in the United States spend a significant amount of time being sedentary, they may not always be aware of how much time is actually spent on sedentary behavior, or the factors that contribute to this behavior. In fact, children in the US spend most of their waking hours sitting in classrooms in school and engaging in sedentary technological media, which is equivalent to 2 full-time jobs!

The combination of sedentary technological media, sedentary behaviors, and nonoptimal nutrition severely impacts the health of children due to the increased risk of developing chronic, noncommunicable diseases, and these are directly related to childhood obesity. Currently, 17% of the pediatric population in the US is obese.² Furthermore, these children have a high

probability of becoming obese adults, placing them at high risk for developing metabolic syndrome, nonalcoholic fatty liver disease, polycystic ovarian syndrome, insulin resistance, and type 2 diabetes mellitus. These diseases have a risk-conferring lipid/lipoprotein profile described as atherogenic dyslipidemia (elevated levels of triglycerides and low-density lipoprotein cholesterol and low levels of high-density lipoprotein cholesterol), which emerge as an important marker for development of adult cardiovascular disease.^{2,3} Management of these chronic diseases results in a significant economic burden to our health care delivery system. Therefore, proactive prevention of these noncommunicable diseases through the reduction of time spent engaging in sedentary technological media, an increase in physical activity, and dietary improvements must begin in early childhood and continue throughout the lifespan.

The purpose of this article is to: (1) assess the effects of sedentary technological media on health outcomes for children in the US; (2) review the chronologic change in the decreased time spent in physical activity at school; (3) describe national initiatives to increase physical activity and decrease sedentary behavior in children; and (4) suggest effective strategies that PNPs can employ to reduce sedentary behavior of their pediatric patients.

SEDENTARY TECHNOLOGICAL MEDIA AND SEDENTARY BEHAVIOR IN CHILDREN RELATED TO MEDIA USE

Technology has dramatically changed how children spend their free time. In the last decade there has been a major increase in the time spent in sedentary technological media behavior. A comprehensive study during 3 separate time frames (1999, 2004, and 2009) found that the time 8- to 18-year-olds spent using media correlated strongly with sedentary behavior. It was determined the average increase in sedentary time exploded from 6.5 to 10.45 hours per day due to the variety of media available to children, plus the ability to use multiple sources of media simultaneously.¹ Differences in use of media also vary by age. Children between the ages of 6 and 10 spend a minimum of 5.28 hours/day, children 11-14 spend 8.40 hours/day, and 14- to 18-year-olds spend 7.48 hours/day with sedentary technological media.⁴ In 2015, a Pew report indicated 92% of teens own and use smartphones. Twenty-four percent reported constant use during waking hours.⁵

In addition, there is a racial disparity with regard to total time spent with sedentary technological media. In a typical day, Hispanics and blacks spend 13 hours using media that promotes sedentary behavior, as compared with 8.5 hours for white children. In fact, with smartphone use, non-Hispanic blacks are the highest users at 84% compared with Hispanic and whites, who are both at 71%.⁵ High usage of sedentary technological media was also linked to lower grades, less personal satisfaction, and poor relationships with family and peers. This recent cultural shift leaves children with little time for unstructured play or physical activity as well as risks of developing an ongoing sedentary lifestyle, acquiring a noncommunicable disease, and declines in health and life success.^{1,6}

Most of the sedentary technological media studies have been completed on television (TV) usage; however, portable smartphones, iPads, tablets, and computers have the capability to stream TV shows and movies, making screen time more accessible than ever before and linked to an increase in sedentary behavior. The effects of sedentary behavior combined with a lack of physical activity have negative

consequences on health outcomes.⁷ Sedentary behavior has been found to result in an increased body mass index, which correlates with an increased risk of obesity and a decrease in overall levels of fitness.⁷ Increased screen time has also been linked to an increase in high-calorie snacking, poor sleep habits, and loss of sleep, all contributing to sedentary behaviors and a rise in pediatric obesity across age groups.^{8,9}

In addition, self-esteem and academic success are reduced and an increase in attention deficit disorder and depression has been noted with sedentary behavior in children 5-17 years old.⁷ School absenteeism has been related to lack of physical activity and increased screen time (TV viewing and computer use).¹⁰ Children age 6-11 who watch TV for ≥ 2 hours per day and spend ≥ 3 hours per day on a computer have an increase in school absenteeism and obesity. High school students' absenteeism is linked to excessive TV screen time, but not to computer use when used for the completion of homework and not recreational choice.⁷

IMPACT OF SCHOOL ATTENDANCE ON PHYSICAL ACTIVITY

When contemplating how, when, and where children have the opportunity to participate in physical activity, time spent in school becomes another key factor. The Institute of Social Research compared how children spent time in school during the 1980s versus time spent in 2004.¹¹ They found students spent an additional 2 hours per day in school in the early 2000s compared with the 1980s. The increased number of hours spent in school has been postulated as a significant factor in the reduction in structured physical activity, play time, and outdoor activities available for children today.¹¹

American children age 6-18 are expected to attend school for a minimum of 7 hours per day. These 7 hours are comprised of required academic subjects, recess, lunch, physical education (PE), and different forms of culturally enriching activities.¹² Despite the PE requirement, only 80% of schools in the US actually have policies requiring PE classes. In fact, only 6 states (Illinois, Hawaii, Massachusetts, Mississippi, New York, and Vermont) require PE in

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