Original Article

Trends in sedentary behaviors among high school students: analysis of television and other screen-time activities

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Abstract:

Introduction: Sedentary behaviors is expeditiously rising as an issue in public health national and locally. Studying the impact of sedentary behaviors on physical activity that can lead to childhood obesity is crucial to understanding the role that physical activity have on childhood obesity and other health risks. The objective of this study were: 1) To assess the trends of sedentary behaviors (screen-time) of high school adolescence in the United States. 2) Compare TV screen-time to other screen-time usage (smartphones, tablets and computer games). Methods: Data obtained from the Youth Risk Behavior Survey of high school students nationally were analyzed to evaluate the sedentary behaviors. Variables included time spent watching television and screen-time usage among African Americans, Caucasian, and Hispanic ethnic groups ranging from grades 9th-12th, using years 2007, 2009, 2011, 2013, and 2015. Analyses included linear regression models and Pearson chi-squares for significant findings. Results: Significant decrease was reported on TV screen-time between 2007 - 15. Other screen-time percentages increased significantly from 2007 to 2015. These significant trends were consistent across race and gender. However, there were not any significant differences across gender or race. Other screen time has certainly overtaken TV watching over last ten years. Conclusions: It is extremely important for students to get as much physical activity needed. Educators, as well as parents should incorporate physical activity levels for students during and after school hours to replace screen-time. Implementing fun and educational physical activity programs can reduce childhood obesity and also improve academic results.

Keywords: Childhood Obesity, Adolescence, Overweight, Physical Activity

Introduction

Screen-based sedentary behavior is taking over for adolescents and becoming a primary behavioral target in preventing obesity. Sedentary behavior is primarily determined as time spent viewing TV, escalating the possibility for overweight and obesity in adolescence. While screen time is increasing, physical activity is continuing to decline. Screen time can affect these adolescences in many ways. Recent studies indicate students who engaged in 2 or fewer hours of screen time a day were less likely to have smoked, bullied another person, be bullied, be in a physical fight, intentionally harm themselves, or have attempted suicide when compared to students who engaged in more than 2 hours a day (Vermont Youth Risk Behavior Survey, 2016). Also, according to Vermont Department of Health, high school students who engaged in 2 or fewer hours of screen time a day were significantly more likely to get A's or B's, feel valued by their community, and participate in at least one hour of after school activities (e.g. sports, band, drama, or clubs run by school or community groups) when compared to students who engaged in more than 2 hours of daily screen time (Vermont YRBS, 2016). According to the American Journal of Preventative Medicine, suggests that study findings are now showing links between sedentary behaviors and a range of health outcomes (Biddle, 2011).

Instead of spending 2 or fewer hours a day on screen-time, many adolescences are spending an average of 3 or more hours watching TV and/or Computer. African American children report spending more time in sedentary behaviors than do Caucasian and Hispanic youth, and youth from lower-income families report more sedentary time than youth from more affluent families, but those disparities are not evident in studies based on objective measures. Older children and teens are more likely to spend more time in sedentary behaviors and to exceed recommended limits on sedentary time than younger children. The evidence on whether girls or boys are more sedentary is mixed. Objective data revealed teenage girls are more sedentary than teenage boys, but surveys indicated boys spend more time playing video games (Lou, 2014). Research shows the amount of time young people spend in sedentary behaviors has increased in recent years, and while this includes TV time, it is a dramatic increase in other types of screen time, such as computers and video games, that appears to be driving the trend (Foehr, 2010). Importantly, watching TV is also linked with unhealthy eating. The association between TV time and overweight and obesity among youth may be due to a number of factors, including unhealthy eating, the biological effects of sitting, spending less time being physically active, or some combination (Lou, 2014). Catherine Steiner-Adair, a Harvard-affiliated clinical psychologist and author, feels that parents are throwing screens at children all day long, giving them distractions rather than teaching them how to self-soothe, to calm themselves down (Brody, 2015). According to the American Academy of Pediatrics (2015), before age

2, children should not be exposed to any electronic media, the pediatrics academy maintains, because “a child’s brain develops rapidly during these first years, and young children learn best by interacting with people, not screens.” Older children and teenagers should spend no more than one or two hours a day with entertainment media, preferably with high-quality content, and spend more free time playing outdoors, reading, doing hobbies (Brody, 2015). Previous studies have documented important sex differences in the time devoted to physical activity (PA) and screen-based activities (ST). Adolescent males have generally higher levels of physical activity than their female counterparts, but it is unclear whether this sex difference would persist in the adherence to both PA and ST recommendations concurrently. Females and males engage differently in sedentary behavior. For example, males spend more time watching television or playing video and computer games while females spend considerable time in communication-based sedentary behaviors such as talking on the phone, texting and instant messaging. Females are also greater users of the new media, including social networking sites such as Facebook, Instagram, Snapchat and Twitter (Philippe, 2016). Older children and teens are more likely to spend more time in sedentary behaviors and to exceed recommended limits on sedentary time than younger children. Recognizing these sedentary trends and behaviors among adolescence and associated distinctions will help inform discipline to lower screen time among youth. The primary objective of the study was to analyze trends of sedentary behaviors and correlate them towards one another. The screen time that was compared in this study were TV and computer/video game. This study was based on 2007, 2009, 2011, 2013, and 2015 High School Youth Risk Behavior Survey obtained from the CDC. Self-reported feedback of African American, Caucasian, and Hispanic youth who played/watched 3 or more hours of screen time per day (on an average school day).

Methodology

Data for this study was acquired from the Center of Disease Control and Prevention Youth Risk Behavior Survey (YRBS). Sample for this study included high school students nationally ranging from grade 9-12 from years 2007, 2009, 2011, 2013, and 2015 in the United States. The intent of this study was to compare sedentary behavior which in this case is screen-times usage among African American, Caucasian, and Hispanic grade population who used the computer or watched TV 3 or more hours per day for something that was not school work on an average school day. Primary variables for this study were based on two major questions on YRBS: 1) On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Count time spent on things such as Xbox, PlayStation, an iPod, an iPad or other tablet, a smartphone, YouTube, Facebook or other social networking tools, and the Internet.) 2) On an average school day, how many hours do you watch TV? Analyses included linear regression models and Pearson chi-squares for significant findings.

Results

The study sample size was 15,536. Computer screen time has significantly increased from the years 2007 to 2015, while television screen time decreased. African American youth have a higher percentage than Caucasians and Hispanics when it comes to watching TV and playing computer/video games. Male and females did not show any significant differences, although Caucasian males tend to spend more time watching TV and playing computer/video games than Caucasian females. Figure 1 represents African American, Caucasian, and Hispanic youth who played video, computer games or used a computer 3 or more hours per day compared to youth who watched 3 or more hours per day of TV.

Fig.1. Trends in Screen-Time by Race

(D)

Graph A represents sedentary behaviors among all race for the years of 2007, 2009, 2011, 2013, and 2015. Computer and other screen-time behaviors increased from 2007 (24.9%) to 2015 (41.7%). TV time

decreased as the years went by. In 2007, 35.4% of students reported watching TV 3 or more hours a day and 2015, 24.7% reported watching TV 3 or more hours a day. Graph B shows comparison between two sedentary behaviors, TV and computer screen-time. Caucasian high school students (9th-12th) shows that the amount of TV time decreased while computer time increases throughout the years. Caucasian has the lowest percentages compared to African American and Hispanic adolescence. Graph C represents comparison between two sedentary behaviors, TV and computer screen-time. Hispanic high school students (9th-12th) shows that the amount of TV time decreased while computer time increases throughout the years. Hispanic percentage rates increased from 26.3% in 2007 to 46.2% in 2015. Hispanic rates for 2007 TV screen time was 43.0% and 28.2% by the year of 2015. Graph D African American adolescents spend more time out of all ethnic groups watching TV and using the computer or playing video games, followed by Hispanics. African American percentage increased on computer screen time from 30.5% in 2007 to 44.6% in 2015. In comparison, African American rates for TV screen time in 2007 was 62.7% and 39.2% by 2015.

Fig. 2. Trends in TV Screen-Time by Demographics (Gender & Race)

Figure 2 represents trends of TV screen-time by gender and race. Although there were significant findings for TV screen-time of high school adolescences, there was not any significant differences between genders for all three races. African Americans had a higher percentage than Caucasian and Hispanic high school students. TV screen-time has decreased from 2007 to 2015 within all race.

Fig.3. Trends in Computer/Video Screen-Time by Demographics (Gender & Race)

Figure 3 represents trends of Computer screen-times between African American, Caucasian, and Hispanic race and by gender. There were no significant differences between male and female. African Americans had a higher percentage than Caucasian and Hispanic high school students. Computer and other screen-time has increased from 2007 to 2015 within all race.

Strengths and Limitations One of the major strength of this study was the sample size (15,536) and it was a national data. Questions for the survey have been previously validated and has been a standard to assess youth risk behaviors nationally. A major limitation for the study is that the responses are self-reported. Although trends for television watching and other screen-time were analyzed, the additive effect of TV + other screen time could not be determined. Future studies should include analyses that can support determining combined screen-time patterns so that overall sedentary time can be calculated.

Discussion

Summary of Significant Findings

This study had significant findings. All findings of sedentary trends were significant, but there were not any major differences between each gender. African American lead with a higher percentage for both TV and

computer screen-time, followed by Hispanics then Caucasian. High school youth are spending more hours on a computer and/or in front of a TV and being less physical active. Spending 3 or more hours on screen-time as adolescents can result in childhood obesity and lead to other chronic health risks in the future. It is extremely important for students to get as much physical activity needed. Educators, as well as parents should extremely enforce improving physical activity levels for students during and after school hours

Risks Excessive TV viewing can be responsible for poor grades, sleep problems, behavior problems, obesity, and risky behavior. Most programming in today's society does not teach what parents say they want their children to learn. Multiple shows are filled with stereotypes, violent solutions to problems, and mean behavior. Advertisers target kids, and on average, children see tens of thousands of TV commercials each year. This includes many ads for unhealthy snack foods and drinks. Children and youth see, on average, about 2,000 beer and wine ads on TV each year (Boyse, 2010).

Implications for Educators Since physical activities is highly decreasing, interventions should be implemented educationally so that students can learn and become physically active at the same time in many different ways that will make being active fun and attractive. Many study findings suggested a connection between sedentary behaviors including weight gain, obesity, and increased BMI later in life (Lou, 2014). Adolescents who are overweight or obese are more likely to become overweight or obese later in their adult lives. Preliminary understanding and interventions is demanding considering that childhood obesity is a continued dilemma. Educators have seen firsthand during the past two decades that children and adolescents in the United States are becoming bigger and unhealthy (Wechsler, 2004). Students spend most of their time in a school setting. Teachers have great influences over their lives. The Center for Disease Control and Prevention (CDC) have published guidelines that identify school policies and practices most likely to be effective in promoting lifelong physical activity and healthy eating (Wechsler, 2004). Parents play a big role in their children's lives. One way to help them decrease the usage of screen-time is take away the number of TV's they have around the house and help encourage them to become more physical active. The average household has 3 television sets, and over 40% of children have one in their bedroom by the time they're 6 years old (Ravichandran, 2015). Parents should get involve with the activities as well.

Conclusion

Results of this study shows consistency with previous research that has indicated the significance of physical activity and childhood obesity. These results indicate more and more youth is spending time in front of a computer and/or TV rather than getting the right amount of physical activity in a day. Based on these results, educators and other authority figures will be able to better understand childhood obesity and the importance of physical activity. Increasing levels of physical activity may result to the decrease of childhood obesity and also may improve academic performances (Joshi, 2011). The obesity epidemic is one of the greatest public health, social, and economic challenges of the 21st century (Wechsler, 2004). The State Education Standard: Childhood Obesity mentions, without a strong contribution from schools, we are not likely to reverse the epidemic. Improving and intensifying efforts to promote physical activity and healthy eating is entirely consistent with the fundamental mission of schools: educating young people to become healthy, productive citizens who can make meaningful contributions to society (Wechsler, 2004).

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