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International Trends in Adolescent Screen-Time Behaviors From 2002 to 2010



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 A B S T R A C T

Purpose: Engaging in prolonged screen-time behaviors (STBs) is detrimental for health. The objective of the present analyses was to examine temporal trends in TV viewing and computer use among adolescents across 30 countries.

Methods: Data were derived from the cross-national Health Behaviour in School-aged Children study. Data on TV viewing and computer use for gaming and nongaming purposes were collected in 2002 (n = 139,725 [51.4% girls]), 2006 (n = 149,251 [51.3% girls]), and 2010 (n = 154,845 [51.2% girls]). The temporal trends in TV viewing and computer use were each tested for all countries combined and for each individual country by sex-specific univariate analysis of variance.

Results: Between 2002 and 2010, TV viewing decreased slightly in most of the 30 countries among both boys and girls. This decrease was more than offset by a sharp increase in computer use, which was consistent across all countries. Overall, boys reported more hours of STBs. They also reported a slightly larger decrease in TV viewing and slightly larger increase in computer use. STBs were generally more frequent on weekend days.

Conclusions: The overall cross-national increases in STBs should be a call to action for public health practitioners, policy-makers, and researchers that interventions specifically focused on reducing STBs in youth are sorely needed. Because all countries experienced a trend in the same direction, it might be fruitful to learn more about the determinants of STBs among those countries in which hours of STBs are generally low as compared with other countries.

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 IMPLICATIONS AND CONTRIBUTION

Within a large cross-national study of 30 countries that used a comparable measurement approach, the time adolescents engaged in overall screen time increased between 2002 and 2010. These findings indicate that a public health call for action is needed to implement interventions to reduce screen-time behaviors in youth on an international scale.

Conflicts of Interest: All authors declare that they have no competing interests.

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Engaging in screen-time behaviors (STBs) such as TV viewing and computer use is an important indicator for time spent sedentary although it is acknowledged that non-STBs also contribute to the total time being sedentary [1–3]. Numerous reviews have highlighted that STBs are associated with a range of

adverse psychosocial and physical health outcomes independent of moderate-to-vigorous physical activity in children and adolescents [4,5]. However, time spent in STBs is high among children and becomes even more prevalent among adolescents [6]. There is some evidence suggesting that it also tracks moderately from childhood to adulthood [7]. Developing interventions to reduce STBs among children and adolescents is therefore of high priority. From a public health perspective, it is essential to monitor trends in health-related behaviors such as STBs to provide information about the success of appropriate policies and programs to reduce their prevalence [8] and to understand how lifestyle behaviors of adolescents change over time [9].

From an international perspective, information on recent trends in STBs is limited. Studies conducted in various countries have provided an unclear picture of time trends in STBs [10–14]. Recent findings on total screen time using data from 2000 to 2010 among adolescents in the Czech Republic found a decrease in TV viewing that was replaced by an increase in personal computer use [15]. Another study showed that time spent in STBs was more frequent on weekends than weekdays and showed a larger relative increase on weekends [16]. Because only a few national studies have reported on trends in screen time [12,15–18], a cross-national perspective using a comparable measurement approach is important to shed further light on trends in STBs across different policy and cultural contexts.

The aim of the present analyses was therefore to examine temporal trends in leisure time TV viewing and computer use during weekdays and weekend days among girls and boys aged 11–15 years from 2002 to 2010 across 30 countries, using data from the cross-national Health Behaviour in School-aged Children (HBSC) study [19].

Methods

The HBSC study is a World Health Organization (WHO) collaborative cross-national study with a standardized methodological approach that is used across participating countries. These include countries across Europe and North America as well as Israel. In all participating countries, the HBSC survey is conducted in accordance with the study protocol prepared by the HBSC International Coordinating Centre [20]. Data are collected every 4 years from a nationally representative sample of 11-, 13-, and 15-year-old adolescents within each member country. The primary sampling units are schools and classes. The survey assesses a broad range of self-reported health behaviors and health outcomes. This article presents data from the 2002, 2006, and 2010 HBSC survey waves and includes 30 countries.

Sample

Each of the three samples was based on a nationally representative randomized cluster (i.e., school level) sampling procedure. In total 443,821 (2002: $n = 139,725$ [51.4% girls], 2006: $n = 149,251$ [51.3% girls], 2010: $n = 154,845$ [51.2% girls]), students with complete data for all STBs variables and covariates were included. Surveys were administered by the classroom teachers, participation was voluntary, and anonymity and confidentiality of the participants were ensured. Ethical approval for the study was obtained at the national or regional level. Response rates varied by country and survey wave both at the school level and individual student level. As an example, in 2010, response rates at the individual level ranged from 44% to 92%. All

survey procedures for each wave were documented and can be downloaded at <http://www.hbsc.org/methods/index.html>.

Survey items

Screen time. Two STBs were assessed in a comparable manner in the last three HBSC surveys across 30 countries and regions: TV viewing and computer use during leisure time. For some analyses, the hours per day of TV viewing and computer use were summed to represent the overall amount of STBs. In previous studies, test-retest reliability of the TV viewing and computer use outcomes was assessed across different countries, and results were acceptable for both STB outcomes [21–24].

TV viewing. TV viewing during leisure time was assessed by asking “About how many hours a day do you usually watch television (including DVDs and videos) in your free time?” The DVD wording was added in 2006. Response options were consistent among all the survey waves and ranged from “none at all” to >7 hours/day. Students were asked to report separately on TV viewing during weekdays and weekend days. Responses were recoded as follows: “none at all” = 0, “about half an hour a day” = .5, “about 1 hour a day” = 1, “about 2 hours a day” = 2, and so forth to “more than 7 hours a day” = 7.5.

Computer use. In 2002, computer use was measured by asking “about how many hours a day do you usually use a computer (for playing games, e-mailing, chatting, or surfing the Internet) in your free time?” In 2006 and 2010, this single question was subdivided into two questions to be more detailed. The item “about how many hours a day do you usually use a computer for chatting online, Internet, e-mailing, homework, and so forth in your free time?” represents the nongaming part of computer use. The second question is phrased “about how many hours a day do you usually play games on a computer or games console (PlayStation, Xbox, GameCube etc.) in your free time?” and represents the gaming part of computer use. Each question was asked for weekdays and weekends. Responses were recoded as continuous in the same way as for TV viewing. Because a single item measuring computer use for gaming and nongaming was used in 2002, the separate items for gaming and nongaming computer used in 2006 and 2010 were combined to enable trends over time to be examined more accurately. In addition, we also examined changes in nongaming and gaming computer use in isolation by reporting changes in hours per week from 2006 to 2010.

Covariates

Because STBs differs for boys and girls [25,26], all analyses were stratified by gender. Age and family affluence (proxy for socioeconomic status) have also shown to be correlated with STB [26,27], and therefore we controlled for these variables in our analyses. Because the sampling was based on three specific age groups (i.e., 11-, 13-, and 15-year olds), age was treated as a three-stage categorical variable. The family affluence scale (FAS) provides a valid measure of household material affluence among adolescents [28]. Four items are included to characterize family affluence: number of computers, car ownership, family holidays in the past year, and having one’s own bedroom. Responses to these items were summed and treated as a composite sum score. All covariates were collected using the same items in all three survey waves.

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