



Sedentary patterns and media availability in European adolescents: The HELENA study[☆]

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ABSTRACT

Objective. To describe sedentary behaviors in adolescents and to examine the influence of media availability on TV viewing.

Method. The study assessed 3278 adolescents (1537 males and 1741 females, 12.5–17.5 years) involved in the HELENA study (2007). Adolescents reported hours of TV viewing, computer games, console, internet for study and non-study reasons, and study, as well as availability of TVs, computers and consoles.

Results. Time spent in sedentary behaviors was higher during weekends (all $p < 0.001$). Males spent more hours on TV viewing (for ≥ 15 years at weekends), playing computer games and console games while females spent more time studying and surfing for non-study reasons. During weekdays, one third of adolescents exceeded the screen time guidelines (> 2 h/day) based solely on TV viewing, whereas around 60% exceeded it at weekends. Having a TV or a console in the bedroom was associated with higher TV viewing (OR = 2.66; 95% CI 2.23–3.18; and OR = 1.92; 95% CI 1.61–2.28, respectively) whereas the presence of computer reduced it (OR = 0.57; 95% CI 0.48–0.68).

Conclusion. Adolescents living in Europe are not meeting media recommendations, especially during weekend. The absence of a TV in the adolescents' bedroom might reduce TV viewing. Further studies are needed to confirm or contrast our findings.

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Introduction

Physical inactivity is considered one of the biggest public health concerns (Blair, 2009). In developed countries, physical inactivity is an important cause of chronic diseases and premature mortality (Mokdad et al., 2004). Physical activity guidelines have focussed largely on accumulate enough moderate-to-vigorous physical activity (Owen et al., 2009). However, recently special attention has been given to the deleterious effects of sedentary behaviors. In adults, there is a dose–response association between sitting time and mortality from all causes and cardiovascular disease (Katzmarzyk et al., 2009). In adolescents, television (TV) viewing is associated with obesity (Vicente-Rodríguez et al., 2008), even in those who achieve high levels of physical activity (Eisenmann et al., 2008), and with metabolic cardiovascular disease risk factors (Ekelund et al., 2006; Martínez-Gómez et al., 2010).

With the aim of reducing the screen-time among children and adolescents, the American Academy of Pediatrics (AAP) already in 2001 recommended (i) that youth should not spend more than 2 hours on TV viewing and (ii) to remove TVs from youth's bedrooms (American Academy of Pediatrics, AAP, 2001). Later, other countries also launched screen-time recommendations for children and adolescents (Department of Health and Aging, DoHA, 2004; The Public Health Agency of Canada, PHAC, 2002). Although the prevalence of TV viewing in European adolescents showed minimal changes since 1985/86 to 1997/98 (Samdal et al., 2007), nowadays, the electronic offer for entertainment is much more accessible. In this sense, 65% of U.S. children had 3 or more TVs at home and 80% had access to computer and videogames in 2005 (Roberts et al., 2005). In Australia, 95% of children used computers and 71% played with electronic games during 2003 (Australian Bureau of Statistics, ABS, 2003).

There is evidence that the prevalence of sedentary behaviors increases through adolescence (Brodersen et al., 2007; Hardy et al., 2007). Indeed, there seem to be an increase in time spent in sedentary behaviors during the transition from high school to university (Pullman et al., 2009). Shi et al. (2006) found that adolescents reported on average 11 h/day studying during weekdays (including school schedules). On the other hand, sedentary behaviors seem to be gender-specific, with males reporting more TV (te Velde et al., 2007) or screen-time than females (Sisson et al., 2009). Furthermore, having a TV in the adolescent's bedroom seem to be associated with a higher screen time (Delmas et al., 2007), but more studies are needed to confirm this observation.

The prevalence of sedentary behaviors in current adolescents living in Europe is now known. The HELENA study (Healthy

Lifestyle in Europe by Nutrition in Adolescence) allows us to describe the prevalence of sedentary behaviors in a sample of adolescents from nine European countries. The objectives of this study were: (1) to describe the prevalence of sedentary behaviors by age and gender, (2) to describe the electronic media availability at home (TV, computer and console), and (3) to examine the relationship between electronic media availability and the risk of excess TV viewing (> 2 h/day).

Methods

Study design

The HELENA study (www.helenastudy.com) is a European Union-funded project on lifestyle and nutrition among adolescents from 10 European cities: Athens and Heraklion in Greece, Dortmund in Germany, Ghent in Belgium, Lille in France, Pecs in Hungary, Rome in Italy, Stockholm in Sweden, Vienna in Austria, and Zaragoza in Spain. Data collection took place between October 2006 and December 2007. More detailed information on the study design has been published elsewhere (Moreno et al., 2008). The study was approved by the Research Ethics Committees of each city involved. Written informed consent was obtained from the parents of the adolescents and the adolescents themselves (Béghin et al., 2008). As the aim of the study was to assess the nutritional status of the adolescent population in Europe during the design phase, we checked for the variability of a large set of nutritional status indices obtained in previous studies. The one showing the largest variability was body mass index (BMI). Therefore, we estimated the sample size according with the mean BMI and variance values, for each sex and age strata. This procedure ensured us to adequately describe all the variables included in the study. For the sample size calculation, a confidence level of 95% and an error of ± 0.3 was assumed. The sampling was performed in a multiple-stage random sample manner, using first schools as random units and subsequently, school-classes as the secondary sampling units. Complete school classes had a minimum of 20 students, and similar age and sex distribution was assumed.

From a total sample of 3528 adolescents who participated in the HELENA study, 3278 adolescents (1537 males and 1741 females, 12.5–17.5 years) fulfilled at least 75% of the sedentary questionnaire and were included in the present report.

Data collection

A self-report sedentary behavior questionnaire (designed *ad hoc*) was administered during the school hours as described elsewhere (Vicente-Rodríguez et al., 2008). Adolescents reported for both the hours TV viewing, playing with computer games, playing with console games, surfing by internet for reasons other than study, surfing by internet due to study reasons, and studying (non-school time) for week and weekends days. They selected one of the following categories: (1) none, (2) less than ½ hour, (3)

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