Preventive Medicine 67 (2014) 128–133

Contents lists available at ScienceDirect

Preventive Medicine

journal homepage: www.elsevier.com/locate/ypmed

Electronic screen use and selected somatic symptoms in 10–12 year old children

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ARTICLE INFO

Available online 19 July 2014

Keywords:
Screen use
Somatic symptoms
Iceland
Children
Middle school

ABSTRACT

Objective. Screen-based media use by children and adolescents has increased in recent years but the consequences of their use are not well understood. The objective of this study was to provide a comprehensive examination of the relationship between screen-based activities and a selection of single and multiple self-reported somatic symptoms in a large sample of 10–12 year old children.

Method. We use data from the population-based 2011 *Youth in Iceland* school survey (N = 10,829, response rate: 84.5%, boys: 49.9%) that is conducted triennially in 5th–7th grades in all secondary schools in Iceland. Self-reported measures of common screen-based activities were hypothesized to predict the odds of dizziness, tremors, headaches, stomach aches, and multiple symptoms.

Results. In general the reported prevalence of symptoms increased with greater number of hours reported on screen based activity for boys and girls. This held for all individual screen activities as well as the cumulative measure of daily minutes spent on screen-based media and prevalence of one or more somatic symptoms.

Conclusions. This study confirms previous findings and puts forth additional information concerning the relationship between the prevalence of electronic screen use and somatic symptoms in 10–12 year old children.
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Introduction

The increase in general Internet use has resulted in major changes in media technology infrastructure and availability of screen-based activities. This change has had pervasive influence on the nature and characteristics of media consumption among children and youth (Livingstone, 2007; Rideout et al., 2003; Yang et al., 2013). An ongoing debate into this matter concerns the risks and benefits of electronic screen-based activities for the health and well-being of children and youth (Livingstone, 2007; Plowman et al., 2010; Wartella and Jennings, 2000). Despite some evidence suggesting that screen based activities may positively influence adolescents' cognitive functioning (Strasburger et al., 2010), many studies have reported negative effects of screen-based sedentary activities. Some have raised concerns about such activities as a key contributor to a general decrease in physical activity, thus negatively influencing various health outcomes (Hands et al., 2011; Melkevik et al., 2010; Serrano-Sanchez et al., 2011). However, the direct relationship between screen use and physical activity is generally weak-to-moderate (Gebremariam et al., 2013; Iannotti et al., 2009; Marshall et al., 2006).

Given the expansion in screen-based gadgets offered to children and youth, such as smart phones, tablets, laptops, and portable gaming devises (Rideout et al., 2003), there appears to be an increase in total media use and exposure (Nelson et al., 2006; Roberts and Foehr, 2008). Roberts and Foehr (2008) reported that children and youth aged 8–18 years in the United States spent on average around 3 h watching TV, 1 h on videos and movies, 50 min playing video games, and approximately 1 h on other computer uses, each day. This totals around 6 h of screen-based activity every day. Other studies have reported similar findings (Biddle et al., 2009; Marshall et al., 2006). Roberts and Foehr (2008) also note that children and adolescents who are heavy TV viewers (defined as 5 h or more per day) also spend more time on other screen based activities (e.g. online video games) compared to light or medium TV viewers. Studies should attempt to identify whether one type of screen activity is associated with health-related outcomes over and beyond other forms, as well as assessing the composite impact of several screen-based activities on different outcomes.

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http://dx.doi.org/10.1016/j.ypmed.2014.07.017
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Screen-based media use and somatic symptoms

Somatic discomfort is a common occurrence among children and youth posing an important public health challenge. Studies have reported that more than one third of children and youth experience somatic pain or discomfort episodes once a week or more often (Roth-Isigkeit et al., 2005). There is also some evidence for a concurrent increase in prevalence rates for somatic symptoms and screen based sedentary behaviors in recent years (Hakala et al., 2002). However, to-date the evidence for screen based sedentary activities' association with somatic symptoms among children and youth remains unclear.

Kröner-Herwig et al. (2011) studied screen-based activity among adolescent boys and girls and prevalence of pain in a variety of 11 sites, including head, back, stomach and legs. Findings suggested that experiencing symptoms at multiple sites (i.e. two or more during the past 6 months) was predicted by time spent watching TV/video among girls. Some other studies have indicated a positive association between screen use and somatic complaints. For example, Iannotti et al. (2009) found that time spent on screen based media use significantly predicted adolescents' daily physical health complaints, such as headaches or stomachaches. Further, Torsheim et al. (2010) analyzed data from a large sample of 11-, 13- and 15-year-old adolescents from all the Nordic Countries and Greenland (N = 31,022). They found an association between daily hours of screen based activity and somatic symptoms (i.e. headache and backache) in all countries. For boys, increased hours spent on each of the three screen based media activities significantly increased the odds of recurrent headaches. For girls, computer use and TV viewing, but not computer gaming, were associated with increased odds of recurrent headaches. However, these associations were rather weak. The authors suggested that screen based activities may not be a direct causal factor for physical health complaints but rather an indirect contributor. Taken together, there is growing but conflicting research concerning a possible relationship between somatic symptoms and screen use behavior in children and adolescents.

The present study

Considering the relatively high prevalence of somatic symptoms among children and adolescents and the increase in prevalence of screen-based activities, the aim of this study was to carry out a comprehensive examination of the relationship between single and multiple screen-based activities and a selection of four types of self-reported somatic symptoms; dizziness, tremors, headaches, stomach aches, as well as multiple symptoms, in a large sample of middle school children.

Methods

Study design

The present study utilized data from the population-wide Youth in Iceland study conducted in February 2011. The Youth in Iceland studies are annual cross-sectional school-based surveys carried out by the Icelandic Centre for Social Research and Analysis (ISCRA) at Reykjavik University in co-operation with the Icelandic Ministry of Education, Science and Culture. The study is conducted among children and youth in all primary and secondary schools in Iceland and measures a large variety of demographic and health-related variables. Theoretical background of the Youth in Iceland surveys has been provided by Sigfusdottir et al. (2009) and description of data collection procedures has been published by Kristjansson et al. (2013).

Sample and participants

The present sample consisted of 10,829 10–12-year-old children (i.e. 5th–7th graders) in Iceland at the time of the survey. Students in all schools in Iceland that attended school on the day of the survey were invited to participate in the study. The response rate was 84.5% (49.9% boys) of all eligible 5th–7th grade students. Participating schools were 156 out of the total of 167 (93.4%) schools in the country that include the aforementioned grades. All 11 non-participating schools were small rural schools with 10 students or less. A sample of schools was selected for a background inquiry into patterns of within school non-response. Most non-respondents were absent due to illness, field trips or for unexplained reasons. Under supervision from ISCRA, teachers in each school managed the in-class questionnaire completion. All participants answered the questionnaires anonymously and all aspects of data collection, including passive parental consent, were in compliance with Icelandic law on the protection of human subjects.

Measures

Somatic symptoms

Participants were asked if they had experienced dizziness, tremors, headache and stomach ache during the last seven days. For each symptom the response categories were coded on a five-point-scale; 1 = 'never', 2 = 'almost never', 3 = 'seldom', 4 = 'sometimes' and 5 = 'often'. For the purpose of our logistic regression analyses responses were dichotomized into 0 = 'Never, almost never or seldom', and 1 = 'sometimes or often'.

Screen use

Screen use was measured with four questions assessing the average time spent on a typical day on the following activities; watching TV/DVD/VCR,

Table 1
Population characteristics in the 2011 *Youth in Iceland* study.

Characteristic	Boys % (n/N)	Girls % (n/N)
Gender (N = 10829)	49.9 (5349/10726)	50.1 (5377/10726)
Grade		
5th (10–11 year olds) (n = 3702)	34.6 (1841/5324)	34.4 (1842/5356)
6th (11–12 year olds) (n = 3477)	31.3 (1669/5324)	33.4 (1790/5356)
7th (12–13 year olds) (n = 3551)	34.1 (1814/5324)	32.2 (1724/5356)
Family structure		
Lives with both biological parents	74.9 (4004/5349)	73.8 (3970/5377)
Lives in different arrangements	25.1 (1345/5349)	26.2 (1407/5377)
School (urban/rural)		
Urban	66.0 (3528/5348)	66.2 (3557/5372)
Rural	34.0 (1820/5348)	33.8 (1815/5372)
How often during last 7 days have you felt dizzy?		
Never, almost never or seldom	87.8 (4610/5252)	82.3 (4354/5292)
Sometimes or often	12.2 (642/5252)	17.7 (938/5292)
How often during last 7 days have you experienced tremors?		
Never, almost never or seldom	94.4 (4912/5205)	92.7 (4874/5259)
Sometimes or often	5.6 (293/5205)	7.3 (385/5259)
How often during last 7 days have you experienced headache		
Never, almost never or seldom	79.0 (4101/5194)	70.0 (3690/5270)
Sometimes or often	21.0 (1093/5194)	30.0 (1580/5270
How often during last 7 days have you experienced stomach aches		
Never, almost never or seldom	81.8 (4237/5181)	71.3 (3744/5254
Sometimes or often	18.2 (944/5181)	28.7 (1510/5254)
Time watching TV/VCR/DVD		
0–1 h per day	56.1 (2909/5181)	66.5 (3490/5248)
2–3 h per day	35.0 (1813/5181)	28.4 (1490/5248)
4 h or more per day	8.9 (459/5181)	5.1 (268/5248)
Time spent on the Internet (chatting, playing games, etc.)		
0–1 h per day	66.3 (3384/5105)	75.4 (3908/5185)
2–3 h per day	24.4 (1246/5105)	19.8 (1026/5185)
4 h or more per day	9.3 (475/5105)	4.8 (251/5185)
Time spent on computer games (excl. online games)		
0–1 h per day	73.4 (3752/5114)	94.0 (4863/5175)
2–3 h per day	17.7 (904/5114)	4.3 (224/5175)
4 h or more per day	9.0 (458/5114)	1.7 (88/5175)
Time on other computer uses (excl. all Internet)		
0–1 h per day	88.1 (4535/5148)	93.9 (4893/5210)
2–3 h per day	8.2 (420/5148)	4.9 (253/5210)
4 h or more per day	3.7 (193/5148)	1.2 (64/5210)
Multiple pain symptoms (two or more) during the last 7 days?		
No	83.2 (4246/5104)	74.0 (3827/5174)
Yes	16.8 (858/5104)	26.0 (1347/5174)

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