Journal of Adolescence 48 (2016) 11–17

Contents lists available at ScienceDirect

Journal of Adolescence

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

Screen time, weight status and the self-concept of physical attractiveness in adolescents

Vivien Suchert*, Reiner Hanewinkel, Barbara Isensee

Institute for Therapy and Health Research (IFT-Nord), Harmsstrasse 2, 24114 Kiel, Germany

ARTICLE INFO

Article history:
Available online 9 February 2016

Keywords:
Screen time
Body satisfaction
Weight status
Obesity
Adolescence

ABSTRACT

Adolescents in modern societies spend about 3 h per day in front of small recreational screens. The present study aims at investigating the relationships between screen time and different indicators of overweight. In addition, associations with the self-concept of physical attractiveness and perceived weight status will be examined. In a total sample of 1228 students (47.5% girls) aged 12–17 years (M = 13.74, SD = 0.68) cross-sectional associations were determined by conducting multiple linear regression analyses. Screen time showed a significant positive dose–response relationship with body mass index percentile, waist circumference, body fat, waist-to-height-ratio, and a negative association with self-concept of physical attractiveness independent of age, gender and moderate to vigorous physical activity. Thus, screen time seems to be associated with adolescent overweight, abdominal obesity, and body dissatisfaction. Reducing adolescents' screen time could be a promising approach for primary prevention of obesity and for the promotion of a positive physical self-concept.

Introduction

Adolescence is a critical time period concerning activity-related health behavior. While levels of moderate to vigorous physical activity remarkably decrease (Nader, Bradley, Houts, McRitchie, & O'Brien, 2008), the time students engage in sedentary leisure-time pursuits increases (Pate, Mitchell, Byun, & Dowda, 2011). Screen-based sedentary behaviors like watching television (TV) or using a computer are most common among adolescents in modern societies. On average, adolescents spend about 3 h a day in front of small recreational screens (Hardy, Dobbins, Booth, Denney-Wilson, & Okely, 2006; Pate et al., 2011). There are several guidelines recommending less than two hours of recreational screen time per day in youth (e.g. Tremblay, LeBlanc, Janssen, et al., 2011). However, over 50% of adolescents exceed these recommendations (Sisson et al., 2009).

In a number of studies, high levels of screen-based sedentary behavior in youth were associated with a higher risk for obesity (Costigan, Barnett, Plotnikoff, & Lubans, 2013; Mitchell, Pate, Beets, & Nader, 2013; Tremblay, LeBlanc, Kho, et al., 2011). More than 20% of children and adolescents in developed countries are overweight, while obesity rates have remarkably increased during the past decades worldwide (Ng et al., 2014). Overweight and abdominal obesity are associated with increased cardiovascular and metabolic morbidity, for instance: elevated blood pressure, atherosclerosis, metabolic syndrome, type 2 diabetes mellitus, as well as cardiac structural and functional changes (Raj, 2012). In studies investigating the relationship between screen time and weight

* Corresponding author. Tel.: +49 431 570 29 39; fax: +49 431 570 29 29.
E-mail address: suchert@ift-nord.de (V. Suchert).

http://dx.doi.org/10.1016/j.adolescence.2016.01.005
0140-1971/

status, Body Mass Index (BMI) was the most frequently used indicator for overweight and obesity. Its association with screen time in adolescence is well established (Tremblay, LeBlanc, Kho, et al., 2011). For instance, a recent study found screen time to influence changes in BMI percentiles especially in the upper tail of the BMI distribution (Mitchell et al., 2013). However, there are some controversies surrounding the single use of BMI due to inconsistent associations with mortality and metabolic health (Ahima & Lazar, 2013). Adolescents' waist circumference seems to be as good as BMI percentile for predicting cardio-metabolic risk and in some cases even more beneficial (Bluher et al., 2013). Furthermore, even individuals classified as normal weight by their BMI could show metabolic risk factors like hyperglycemia, dyslipidemia and hypertension (Ruderman, Chisholm, Pi-Sunyer, & Schneider, 1998). Thus, using only BMI to diagnose obesity could lead to misinterpretation of health risk. Various indicators providing better information about abdominal obesity like waist circumference and percentage body fat should be considered (Teixeira, Alves, Moreira, & Peluzio, 2015). Up to now, little is known about associations between screen time and other indicators of weight status than BMI in adolescence. If there are further associations even among normal weight adolescents, this might enhance the clinical relevance of screen time as an important health risk factor.

In addition, screen time was related to impairments of adolescents' mental health as well (Suchert, Hanewinkel, & Isensee, 2015a). The influences of mass media might be one important mechanism linking screen-based sedentary behavior to adverse mental health effects, since unrealistic body ideals – thin females and muscular males – are ubiquitous and negatively associated with the physical self-concept for attractiveness and body satisfaction (Eyal & Te'eni-Harari, 2013; Groesz, Levine, & Murnen, 2002; Suchert, Hanewinkel, & Isensee, 2015b). This negative association might be especially pronounced among overweight students since the discrepancy between their own and the ideal body shape is even larger than in non-overweight students. Students with a higher BMI percentile might be not just dissatisfied with their body due to their body weight but additionally to the comparisons with mostly thin and beautiful characters in the media. However, as described above in the context of physical health, screen time might be connected to a more negative physical self-concept even among normal weight adolescents.

These issues will be explored in the present study. There are three major research questions addressed by this study: 1) examining the relationship between screen time and BMI, body fat, waist circumference as well as waist-to-height ratio, 2) examining the relationship between screen time and the self-concept of physical attractiveness and perceived weight status, and 3) exploring the moderating role of weight status in the association between screen time and self-concept of physical attractiveness.

Material and methods

Procedure and participants

Baseline data from the cluster-randomized controlled trial of the “läuft.” program (Suchert et al., 2013) were used for the current cross-sectional study. The “läuft.” program is a school-based intervention aimed at fostering a physically active lifestyle in adolescence. The whole study was approved by the ethics committee of the German Psychological Society as well as the Ministry of School and Professional Education of Schleswig–Holstein. In order to recruit the study sample 134 secondary schools in the federal state of Schleswig–Holstein in Germany were invited to participate with their 8th grade classes. In total, 29 schools (21.6%) with 61 classes and 1489 students decided to take part in the study. Data collection took place from January to March 2014. Data of 1296 students were eligible. The final analysis sample comprised 1228 participants. Sixty-eight students had to be excluded due to missing values for weight and height.

Measures

Screen time. Students were asked how much time they spent on the most recent school day and the most recent Sunday watching TV/DVDs and using a computer. An average number of minutes spent with each activity was determined by multiplying the school day time by five and the Sunday time by two, summing these scores up and dividing the sum score by seven. Unit of analyses was hours per day.

Physical self-concept. To measure the self-concept of physical attractiveness, five items of the physical self-concept scales by Stiller, Würth, and Alfermann (2004) were used. Students were asked to indicate the extent to which they agree with different statements (4-point rating scale 0 “strongly disagree” to 3 “strongly agree”). In diverse samples good retest reliabilities after five weeks and one year ranging between 0.68 and 0.90 were demonstrated (Stiller et al., 2004). The internal consistencies for the subscale “physical attractiveness” ranged between 0.82 and 0.86. Satisfactory validity was proven using specific self-worth scales (Stiller et al., 2004). For the analyzed sample in the current study, Cronbach's alpha was $\alpha = 0.90$.

Perceived weight status. Students were asked to indicate how they think about their own weight status (5-point rating scale 0 “much too thin” to 4 “much too fat”).

Weight status. Anthropometric data were obtained by trained research staff, while boys were measured by a male and girls by a female staff member. Each student was measured alone in an empty changing room to ensure a private and empathic atmosphere. All measures were disclosed and explicated to the respective student if requested. Standing height was determined using a portable stadiometer (Seca 213, Basel, Switzerland) and body weight as well as body composition (body fat) using a scale with bioelectrical impedance analysis (Omron BF-511, Omron Healthcare, Mannheim, Germany). Students' BMI was calculated (weight/height^2) and converted into age- and gender-specific percentiles using Cole's LMS-method (Cole,