



Article

Risk Factors for Excessive Social Media Use Differ from Those of Gambling and Gaming in Finnish Youth

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Citation: Castrén, S.; Mustonen, T.; Hylkilä, K.; Männikkö, N.; Käiriäinen, M.; Raitasalo, K. Risk Factors for Excessive Social Media Use Differ from Those of Gambling and Gaming in Finnish Youth. *Int. J. Environ. Res. Public Health* **2022**, *19*, 2406. <https://doi.org/10.3390/ijerph19042406>

Academic Editor: Paul B. Tchounwou

Received: 22 January 2022

Accepted: 16 February 2022

Published: 19 February 2022

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Abstract: Purpose: Adolescents' excessive social media use has characteristics similar to other addictive behaviours. This study aims to explore whether the same risk factors are associated with excessive social media use as with excessive gaming and gambling among Finnish adolescents. Methods: Multinomial logistic regression analyses were carried out using the European School Survey Project on Alcohol and Other Drugs data, collected from Finnish adolescents aged 15–16 in 2019 ($n = 4595$). Results: Excessive use of social media was more common among girls (reported by 46% of respondents) than boys of the same age (28%), whereas boys reported both excessive gaming (23%) and gambling (6%) more often than girls (4% and 1%, respectively). All differences between genders were statistically significant ($p < 0.0001$). Daily smoking was associated with a high risk of excessive gambling (AOR = 3.23) and low risk of excessive gaming (AOR = 0.27) but had no significant effect on excessive social media use. Cannabis use in the past 12 months was positively associated only with excessive gambling (AOR = 2.39), while past 12 months alcohol consumption increased the risk for excessive social media use (AOR = 1.25). Conclusions: Adolescent girls are at greater risk of excessive social media use than boys, while boys are at greater risk of excessive gaming and gambling. The associations with known risk factors are somewhat different for excessive use of social media as compared to excessive gambling and gaming and should be acknowledged when developing preventive measures for adolescents.

Keywords: adolescents; ESPAD; excessive social media use; gaming; gambling; substance use

1. Introduction

It is a well-established fact that adolescents, especially boys, often participate in a variety of risky behaviours, such as the use of alcohol, cannabis, tobacco or nicotine products, or gambling and gaming [1–4]. These behaviours may demonstrate features of typical addictive behaviours like constant preoccupation, loss of control, high intensity and frequency, and continuation or escalation of the behaviour despite the occurrence of negative consequences and cause significant distress and impairment to an individual's overall functioning [5]. These behaviours are often interwoven and may feed each other [6,7]. Due to the rapid development of technology, it has been suggested that excessive use of social media may have characteristics similar to excessive (or addiction-like)

behaviours associated with gambling and gaming, thus potentially posing a risk for important areas of functioning among adolescents [8]. Therefore, it is essential to investigate possible factors that may be associated with excessive social media use to gain an up-to-date understanding of these behaviours among adolescents with the intention of developing effective preventive means.

Social networking sites, messaging apps, and other social media channels provide various types of activities and interactions, such as socializing, relaxing, sharing pictures, videos and stories, and chatting [9]. Browsing the web using smartphone applications has become an everyday activity, and the use of the internet for our daily errands is here to stay.

Even if social media use may be linked to positive psychosocial outcomes, such as an increase in social capital and connectedness [10,11], growing evidence has recently raised concerns about excessive use of social media and its associations with the user's overall well-being: substance use, depression, anxiety, and other mental health issues like low self-esteem [11–13].

1.1. Excessive Use of Social Media

Excessive use of social media can be broadly defined as being excessively concerned about social media, being driven by a strong motivation to log on to or use social media, and devoting so much time and effort to social media use that it impairs other social activities, studies/job, interpersonal relationships, and/or psychological health and well-being [5]. These features are similar to other known excessive behaviours (gambling and gaming). Thus, a deeper understanding of their similarities and differences may increase knowledge of this relatively novel research area. Excessive gaming has been found to augment the symptoms of excessive engagement in social networking sites (SNS) and vice versa [14]. Current research has shown that excessive types of social media use are more common among women than men [15,16].

The prevalence of the excessive use of social media has been estimated to vary between 2.8% and 47% [16,17]. The variation of these estimations is due to differences in methodology and cultural reasons and the lack of consensus in defining excessive or problematic social media use and social media addiction as its utmost form [18]. In this study, the expression 'excessive use of social media' refers to self-perceived behaviour [19].

1.2. Excessive Gaming and Gambling

Excessive gaming and gambling have more established definitions compared to excessive social media use as more research has been conducted related to these behaviours. When referring to excessive gaming, the phrase 'problematic gaming' is often used [20]. Also, when referring to excessive gambling, the phrase 'problem gambling' is common. Both problem behaviors have established diagnostic criteria, Gambling Disorder, in the American Psychiatric Association's [21] Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5) and more recently in the World Health Organization's 11th edition, ICD-11. The ICD-11 definitions for Gambling Disorder and Gaming Disorder resemble each other with the characterizations: impaired control over behaviour (e.g., onset, frequency, duration, termination, context); increasing priority given to the behaviour that causes negative consequences to the person's life; continuation of behaviour despite the negative consequences [22]. Those who participate in gaming activities have a higher risk of engaging in gambling and vice versa [23]. The prevalence of problematic gaming among adolescents varies from 1.2% to 18.4%, depending on the measure used; the participation rate in gaming activities has been reported as being 59% among European adolescents in 2019 [2] (ESPAD Group 2020). Problem gambling prevalence rates for adolescents vary from 1.6% to 6.7% [24], 22% of European adolescents had gambled during the past year in 2019. Boys typically gamble and game more than girls and are more at risk of developing problems with gambling [4,25]. In this paper, we use the expression 'excessive gaming and gambling' throughout since we measured self-perceived excessive behaviours [26].

1.3. Risk and Protective Factors for Excessive Behaviours

Substance use has been linked to gambling and gaming in many studies [6,27]. There is also clear evidence that adolescents whose parents are aware of their whereabouts and activities are less likely to participate in risky behaviours [28–30]. Along with the influence of family and parents, the role of peers is developmentally important in adolescents' lives, and peers can boost or prevent adolescents' risky behaviours [31]. Also, factors related to school, for example, low school grades, poor school performance, and skipping school are often linked with risky behaviours [32], and these predisposing factors may also affect orientation to future plans. In contrast, participation in extra-curricular or leisure activities may protect against risky behaviours [33]. Other proximal risk factors, such as family situation/status (e.g., single-parent/two-parent household, parental separation) have also been linked to risky behaviours in youth [34].

As social media has become an important part of daily activities, especially among adolescents, and it is known that involvement in one risky behaviour may predict involvement in other risky behaviours [22], it is important to investigate whether excessive social media use relates to excessive gaming and gambling to find effective preventive measures. This study aims at exploring whether the same risk and protective factors are associated with excessive social media use and excessive gaming and gambling among Finnish adolescents (15- and 16-year-olds).

2. Materials and Methods

2.1. Data

The data for this study was gathered as part of the European School Survey Project on Alcohol and Other Drugs (ESPAD) in Finland in spring 2019. The target population was defined as (1) regular students who (2) turned sixteen in the calendar year of the survey and (3) were present in class on the day of the survey administration. This definition includes students who were enrolled in regular or general studies and excludes both special schools for students with learning disorders or severe physical disabilities and students who did not speak Finnish or Swedish (Finland's national languages).

A two-stage systematic probability-proportional-to-size sampling method using the Nomenclature of Territorial Units for Statistics 2 regions (NUTS 2) as strata and schools as clusters (NUTS 2, 2020) was used to collect a nationally representative sample with a self-administered pen-and-paper questionnaire taken in the classroom. Participation was voluntary, and anonymity was ensured. Those outside the target group and those who had responded inconsistently or had clearly exaggerated or had left unanswered over half of the questions were removed from the data ($n = 435$). An analytical sample including only individuals with valid answers to all variables of interest was created, and the final data included 2027 male and 2133 female students. The school participation rate and the student response rate were both about 90%. The data were weighted to reflect a representative sample of Finnish ninth-graders [2,35].

2.2. Measures

The dependent variables: self-perceived excessive social media use, self-perceived excessive gaming, self-perceived excessive gambling, and independent variables: daily cigarette smoking, alcohol use, cannabis use, weekly sports, weekly hanging out with friends, future plans, family type, and parents' education—together with their definitions and distributions—are presented in Appendix A.

2.3. Statistical Analysis

1. Cross-tabulation with Rao-Scott's chi-square tests were applied to study the differences between boys and girls in excessive social media use, gaming, and gambling in the past 12 months in different categories of the independent variables.
2. Multinomial logistic regression models were fitted separately for the outcome variables (excessive social media use, gaming, and gambling). The effects of each independent variable were first looked at separately. After that, all variables of interest were controlled for. Odds ratios with 95% confidence intervals were then derived from the full model as marginal estimates.

The sample design was taken into account in all analyses by adjusting the student-level standard errors for clustering effects. This was carried out using the survey procedures offered by SAS EG 7.1 (SAS/STAT[®], 2011) [36] using NUTS2 regions (NUTS2, 2020) as strata and schools as clusters.

3. Results

Table 1 shows that 28% of 15–16-year-old boys and 46% of girls reported excessive social media use. To continue, 23% of boys and 4% of girls reported excessive gaming. The respective proportions for gambling were 6% and 1%. All differences between genders were statistically significant at the <0.001 level regardless of the background factors.

As the differences in all dependent variables (excessive social media use, gaming, and gambling) according to all independent variables were of the same direction for boys and girls, we decided to adjust the models for gender and not study boys and girls separately.

Table 2 shows that after all adjustments, girls had a higher risk for excessive social media use than boys (AOR = 2.18, 95% CI 1.84–2.58) and, respectively, a lower risk for excessive gaming (AOR = 0.13, 95% CI 0.09–0.17) and excessive gambling (AOR = 0.08, 95% CI 0.04–0.16). Daily smoking was negatively associated with gaming (AOR = 0.38, 95% CI 0.17–0.85) but had no significant effect on excessive social media use or gambling. In contrast, past 12 months alcohol use was positively associated only with excessive social media use (AOR = 1.25, 95% CI 1.02–1.52) and past 12 months cannabis use was positively associated only with excessive gambling (AOR = 2.39, 95% CI 1.22–4.71). Daily sports activity decreased the risk for gambling (AOR = 0.39, 95% CI 0.19–0.80) but was not related to excessive social media use or gaming. Hanging around with friends was negatively associated with excessive gaming (AOR = 0.54, 95% CI 0.40–0.72) but positively associated with excessive gambling (AOR = 3.34, 95% CI 1.77–6.32). Moreover, parental control was negatively associated with excessive gambling (AOR = 0.39, 95% CI 0.12–0.71) but had no significant effect on excessive social media use or gaming. However, aiming at high school and living in a nuclear family increased the risk for excessive social media use (AOR = 1.27, 95% CI 1.05–1.54 and AOR = 1.28, 95% CI 1.06–1.54, respectively). Parents' education was not associated with any of the outcome measures.

Table 1. Distributions of excessive social media use, excessive gaming, and excessive gambling according to the independent variables among Finnish 15–16 years old boys and girls in 2019 with Rao-Schott's Chi-square test results on statistical significance.

		Excessive Social Media Use			Excessive Gaming			Excessive Gambling		
		Boys	Girls	<i>p</i> (chisq)	Boys	Girls	<i>p</i> (chisq)	Boys	Girls	<i>p</i> (chisq)
Total		28.4%	46.4%	0.001	22.7%	3.6%	0.001	6.4%	0.5%	0.001
Independent variables										
Daily smoking	Yes	16.1%	47.3%	0.001	6.7%	1.9%	0.001	19.4%	0.9%	0.001
	No	29.2%	46.4%	0.001	23.6%	3.7%	ns	5.6%	0.5%	0.001
Past 12 months alcohol use	Yes	26.9%	50.2%	0.001	19.6%	3.1%	0.001	8.8%	0.8%	0.001
	No	30.8%	40.7%	0.001	27.3%	4.2%	0.001	2.8%	0.2%	0.001
Past 12 months cannabis use	Yes	21.6%	40.1%	0.004	15.3%	1.5%	0.001	17.9%	2.0%	0.001
	No	29.4%	46.9%	0.001	24.0%	3.7%	0.001	4.9%	0.3%	0.001
Sports	Yes	28.1%	46.8%	0.001	22.4%	3.5%	0.001	5.6%	0.5%	0.001
	No	29.3%	44.4%	0.018	26.7%	6.1%	0.001	15.8%	0.6%	0.001
Hanging around with friends	Yes	25.3%	50.8%	0.001	17.6%	2.2%	0.001	9.7%	0.5%	0.001
	No	32.1%	41.7%	0.001	29.0%	5.0%	0.001	2.5%	0.6%	0.001
Parental control	Yes	28.7%	46.0%	0.001	22.3%	3.8%	0.001	5.0%	0.3%	0.001
	No	23.2%	49.4%	0.001	21.7%	2.3%	0.001	18.0%	2.7%	0.001
Aims at high school	Yes	31.4%	46%	0.001	24.3%	3.2%	0.001	4.9%	0.3%	0.001
	No	24.5%	47.4%	0.001	20.6%	4.9%	0.001	8.3%	1.3%	0.001
Parents education	Yes	27.8%	46.1%	0.001	20.7%	3.5%	0.001	7.3%	0.4%	0.001
	No	29.8%	47.0%	0.001	27.5%	4.2%	0.001	3.3%	1.1%	0.045
Nuclear family	Yes	30.7%	47.9%	0.001	23.1%	3.5%	0.001	6.1%	0.6%	0.001
	No	22.5%	43.6%	0.001	20.6%	3.7%	0.001	6.7%	0.4%	0.001

Table 2. Risk factors for excessive social media use, excessive gaming, and excessive gambling among Finnish 15–16 years old boys and girls in 2019, unadjusted (OR) and adjusted (AOR) odds ratios with 95% confidence levels (CL).

	Social Media		Gaming		Gambling	
	OR (95% CL)	AOR (95% CL)	OR (95% CL)	AOR (95% CL)	OR (95% CL)	AOR (95% CL)
Gender (ref = boy)	2.18 (1.86–2.56)	2.18 (1.84–2.58)	0.13 (0.10–0.17)	0.13 (0.09–0.17)	0.08 (0.04–0.16)	0.08 (0.04–0.16)
Daily smoking (ref = no)	0.82 (0.58–1.17)	0.83 (0.58–1.21)	0.27 (0.13–0.53)	0.38 (0.17–0.85)	3.23 (1.61–6.47)	0.98 (0.43–2.21)
Past 12 months alcohol use (ref = no)	1.13 (0.95–1.34)	1.25 (1.02–1.52)	0.69 (0.53–0.88)	0.89 (0.65–1.20)	3.35 (1.89–5.94)	1.69 (0.99–2.89)
Past 12 months cannabis use (ref = no)	0.66 (0.49–0.91)	0.77 (0.57–1.06)	0.67 (0.44–1.05)	0.71 (0.40–1.25)	4.94 (2.72–8.95)	2.39 (1.22–4.71)
Sports (ref = no)	1.08 (0.76–1.56)	0.97 (0.68–1.38)	0.67 (0.40–1.14)	0.89 (0.54–1.49)	0.30 (0.14–0.65)	0.39 (0.19–0.80)
Hanging around with friends (ref = no)	1.02 (0.88–1.19)	1.06 (0.91–1.25)	0.58 (0.46–0.73)	0.54 (0.40–0.72)	3.66 (2.16–6.21)	3.34 (1.77–6.32)
Parental control (ref = no)	1.02 (0.79–1.33)	0.94 (0.70–1.26)	1.14 (0.68–1.90)	0.66 (0.39–1.13)	0.24 (0.14–0.42)	0.39 (0.21–0.71)
Aims at high school (ref = no)	1.49 (1.25–1.77)	1.27 (1.05–1.54)	0.79 (0.64–0.97)	1.03 (0.82–1.29)	0.37 (0.22–0.64)	0.71 (0.41–1.21)
Parents education (ref = no)	0.96 (0.80–1.16)	0.87 (0.71–1.06)	0.70 (0.51–0.97)	0.75 (0.53–1.06)	1.75 (0.95–3.24)	1.90 (0.98–3.69)
Nuclear family (ref = no)	1.23 (1.02–1.47)	1.28 (1.06–1.54)	1.26 (0.99–1.59)	1.10 (0.85–1.43)	1.08 (0.63–1.86)	1.35 (0.76–2.39)

4. Discussion

In the present study using a large sample of Finnish adolescents, we examined whether the same factors that are associated with other excessive behaviours (gambling and gaming) also apply to the rising phenomenon of excessive social media use.

In our data, the prevalence of self-assessed excessive social media use was 28% among boys and 46% among girls, which was higher than in previous studies [8,37,38]. The prevalence rate in the current study is not fully comparable to these previous studies due to different study populations and methodologies.

Girls reported excessive social media use more often than boys, which is in line with previous studies. Girls use web-based applications for social communication [39] and are involved in social networking sites and messaging more than boys [40], and girls also use social media for social activities more than boys [41].

Andreassen and colleagues [38] suggest that girls rather than boys are at risk of developing excessive behaviours toward activities that include social interaction. Peris et al. [42] found that girls feel pressured to present themselves with idealized attractiveness by editing their physical appearance before posting it on social media. This could lead to constant waiting for external approval, thus increasing the risk of developing social media addiction [43]. Earlier studies have also shown that girls use different kinds of social media platforms more than boys and more frequently. However, boys use discussion boards more than girls [44].

Spending hours on social media sites possibly fills the need of belonging, which is explained by the Fear of Missing Out (FOMO) [45]. Nowadays, especially during the COVID-19 pandemic, which has increased the time spent on social media [37,46] and related excessive behavioural patterns [37], social media serves as a space for adolescents where they get connected, add and discharge contacts, exchange experiences and information, and thus form their social identity with peers [47].

As expected, the prevalence of excessive gaming and gambling was much higher among boys than girls. Our results are in line with previous studies, demonstrating that

boys are more interested in both gambling and gaming and are thus more vulnerable to developing problems with these behaviours [4,16]. This may be explained by the observation that boys tend to develop problems towards asocial or solitary activities (e.g., gaming) [38]. Boys are more likely to use video games as a primary means of interacting with friends, maintaining friendships, and enhancing social status, while girls use social media for peer communication [40]. Our results also suggest that girls are gaming more than gambling (4% vs. 1%). One explanation may be that, even if the availability of mobile play and other digital payment services have lured more women into the gambling sector, it is possible that they are less likely to take a risky approach to gaming.

The co-occurrence of behavioural and substance addictions has been noted [6]. Also, having a behavioural addiction increases the probability of developing other behavioural addictions [48]. Risk factors related to gambling in the present data were daily smoking and cannabis use, which have been previously found to be associated with problem gambling [6]. These findings emphasise the fact that when planning preventive programs and screening adolescents for possible excessive gambling behaviour, it is important to be aware of the possibility of co-occurring substance use and plan support or treatment accordingly.

Moreover, our results show that hanging out with peers is a much stronger predictor of excessive gambling activity than excessive gaming or social media use. Gambling behaviour possibly differs from gaming and use of social media behaviours. A possible explanation is that gambling can take place online and offline in land-based locations where real-life interaction takes place, and thus it is more strongly affected by peer influence, whereas amongst gamers and social media users, the interaction is mainly virtual [4].

Factors that seemed to protect from excessive gambling were engagement in daily sports activity and parental control, while these factors had no effect on excessive gaming and use of social media. This may indicate that, although these behaviours share commonalities, they do have differences. This notion is even more evident when exploring risk factors for excessive use of social media where the use of alcohol was a risk factor, as noted before [44], along with other factors such as high educational aspirations and living in a nuclear family. Family structure has also been reported to have an important role in adolescent risky behaviours. Growing up in a nuclear family is typically a protective factor for risky behaviours [49], yet in our data, the opposite was true regarding excessive social media use.

All in all, even though excessive gambling and gaming resemble excessive use of social media, excessive social media users seem to differ from gamblers and, to some extent, from gamers. Pontes [14] states that the detrimental effects on health and well-being are more pronounced among excessive gamers than among excessive social media users. As youth gambling is clearly associated with substance use, gamblers share similar characteristics with substance users more than gamers do [50]. Critically, our findings suggest that the group most at risk of developing excessive social media use consists of girls who typically are not considered being at risk for addictive behaviours [51]. Yet, further studies are needed to confirm this and identify individuals who might be more vulnerable to excessive use of social media.

4.1. Practical Implications

Both gambling and gaming disorders are noted as being public health issues [52,53] that cause various types of health and social harms to individuals. When planning prevention programs for excessive gambling and gaming behaviours, it would be beneficial to link with components of other similar behaviours, such as excessive social media use, to increase public awareness about the phenomena. As adolescents are at risk for all these behaviours, prevention programmes should be targeted at them. In practice, asking about the use of social media and possibly using a screening tool (for example, in health checks at schools, e.g., Bergen Social Media Addiction Scale [54]) along with screening other risky behaviours would provide information and help to those at risk.

4.2. Strengths and Limitations

This study has been conducted on a large sample with a high response rate, making the data representative of Finnish 15- to 16-year-olds. The survey captures almost the whole age group. Still, as always with self-reported data, there is a risk that students consciously or unconsciously do not give accurate, honest answers about their actual behaviours. They may be over-reporting as well as under-reporting, depending on what is socially desired/accepted in different contexts. However, a validity report on ESPAD [55] shows that only a very small minority (1–2%) do not answer questions on substance use honestly. There is no reason to assume that this wouldn't be the case with questions on social media use, gaming, and gambling. Because the survey is cross-sectional, no conclusions about causality between the dependent and independent variables can be drawn. Another possible limitation is that the respondents' self-perceived problems in social media (excessive use) were assessed with a few targeted questions and not with a full standardized measure (e.g., Bergen Social Media Addiction Scale).

5. Conclusions

This study found clear gender differences in adolescents' risky behaviours. Adolescent girls seem to be at greater risk for excessive social media use compared to boys. Boys, in turn, are at higher risk for excessive gaming and gambling. In order to find effective preventive means for adolescents, early detection (screening) of various possible risky behaviours should be put in practice and take gender specific factors into account when developing preventive measures and providing support for those in need.

Author Contributions: Conceptualization: S.C., K.R., T.M., M.K., N.M., K.H.; formal analysis: K.R.; data curation: K.R.; interpreting results: K.R., S.C., T.M., N.M., M.K., K.H.; writing original draft: S.C. (text), K.R. (methods, results); writing, review and editing: S.C., T.M., K.H., K.R., M.K., N.M. All authors have read and agreed to the published version of the manuscript.

Funding: The work of Sari Castrén was supported by the Ministry of Social Affairs and Health, Helsinki, Finland (the §52 Appropriation of the Lotteries Act). However, it had no role in the study design, analysis, or interpretation of the results, of the manuscript, or any phase of the publication process. Kirsimarja Raitasalo worked on this project as part of her duties at the Finnish Institute for Health and Welfare. Maria Kääriäinen, Niko Männikkö, Krista Hylkilä, and Terhi Mustonen worked on this project as their duty at Oulu University and Sosped Foundation.

Institutional Review Board Statement: The study procedures were carried out in accordance with the Declaration of Helsinki. The Institutional Review Board of the Finnish Institute for Health and Welfare (THL) approved the study (THL/1740/6.02.01/2018).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The ESPAD trend data are archived at the Italian National Research Council (CNR), and data can be used for research purposes (<http://espad.org/databases>, accessed on 4 May 2021).

Acknowledgments: This article includes data from a database produced by the European School Survey Project on Alcohol and Other Drugs (ESPAD), a collaborative European project owned by ESPAD researchers, and is written in line with the rules for using ESPAD database. The authors would like to acknowledge the members of the ESPAD group who collected the national data and the funding bodies who supported the international coordination of ESPAD: the EMCDDA and the Pompidou Group. Special thanks to the school children, teachers, and national funding bodies who made this project possible. In Finland, the survey data was partially funded by Alko, The Finnish state-owned alcohol retail monopoly, which reports to Ministry of Social Affairs and Health. Alko had no role in the content of the research reports and no influence on publication decisions.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Descriptions and weighted frequencies (% , n) of the dependent variables and the covariates.

	Dependent Variables	% (n)
Self-perceived excessive social media use *	<p>How much do you agree or disagree with the following statements on Social Media communicating with others on the Internet?</p> <p>(a) I think I spend way too much time on Social Media (b) I get in bad mood when I cannot spend time on Social Media (c) My parents say that I spend way too much time on Social Media</p> <p>1 = Strongly agree, 2 = Partly agree, 3 = Neither nor, 4 = Partly disagree, 5 = Strongly disagree. Positive answers ('strongly agree' and 'partly agree') were summed to produce an index score. (A score of 2–3 points = excessive social media use)</p>	37.4% (n = 1676)
Self-perceived excessive gaming *	<p>How much do you agree or disagree with the following statements about gaming on a computer, tablet, console, smart phone or other electronic device?</p> <p>(a) I think I spend way too much time playing games (b) I get in bad mood when I cannot spend time on games (c) My parents say that I spend way too much time on gaming</p> <p>1 = Strongly agree, 2 = Partly agree, 3 = Neither nor, 4 = Partly disagree, 5 = Strongly disagree. Positive answers (strongly agree and partly agree) were summed to produce an index score. (A score of 2–3 points = excessive gaming)</p>	13.1% (n = 586)
Self-perceived excessive gambling **	<p>The Consumption Screen for Problem Gambling:</p> <p>(1) How often (if ever) have you gambled for money in the last 12 months? 0 = I have not gambled for money, 1 = monthly or less, 2 = 2–4 times a month, 3 = 2–3 times or more a week (2) How much time did you spend gambling on a typical day in which you gambled in the last 12 months? 0 = I have not gambled for money/less than 30 min, 1 = between 30 min and 1 h, 2 = between 1 and 2 h, 3 = between 2 and 3 h, 4 = 3 h or more (3) How often did you spend more than 2 h gambling (on a single occasion) in the last 12 months? 0 = I have not gambled for money/never, 1 = less than monthly, 2 = monthly, 3 = weekly, 4 = daily or almost daily. (A score of ≥ 4 points = excessive gambling)</p>	3.5% (n = 155)
Outcome variables		
Daily cigarette smoking	How frequently have you smoked cigarettes during the last 30 days? ('at least one cigarette per day' = daily cigarette smoking)	6.6% (n = 296)
Alcohol use	On how many occasions (if any) have you had any alcoholic beverage to drink during the past 12 months? (>0 = has used alcohol)	60.3% (n = 2643)
Cannabis use	On how many occasions (if any) have you used cannabis during the last 12 months? (>0 = has used cannabis)	9.7% (n = 423)
Parental monitoring	Do your parents know where you spend Friday nights? ('they always know' = parents know about Friday nights)	89.1% (n = 3930)
Weekly sports	How often (if at all) do you . . . actively participate in sports, athletics or exercising. ('at least once a week' or 'almost every day' = weekly sports)	93.5% (n = 4148)

Table A1. Cont.

	Dependent Variables	% (n)
Weekly hanging around with friends	How often (if at all) do you . . . go out with friends in the evening. ('at least once a week' or 'almost every day' = weekly hanging around with friends)	52.6% (n = 2332)
Future plans	Where do you aim at studying after comprehensive school? (aims at secondary school)	66.1% (n = 2957)
Family type	Which of the following people live in the same household with you? (living with mother and father = living with both biological parents)	69.0% (n = 3063)
Parents' education	What is the highest level of schooling your (a) father and/or (b) mother completed? (At least one parent has education after primary school = at least one parent with higher education)	78.4% (n = 3431)

* Holstein et al., 2014. ** Rockloff, 2012.

References

- Delfabbro, P.; King, D.L.; Derevensky, J.L. Adolescent gambling and problem gambling: Prevalence, current issues, and concerns. *Curr. Addict. Rep.* **2018**, *3*, 268–274. [\[CrossRef\]](#)
- ESPAD Group. ESPAD Report 2019: Results from the European School Survey Project on Alcohol and Other Drugs. EMCDDA Joint Publications. Publications Office of the European Union. 2020. Available online: http://espad.org/sites/espad.org/files/2020.3878_EN_04.pdf (accessed on 4 May 2021).
- Botella-Guijarro, Á.; Lloret-Irles, D.; Segura-Heras, J.V.; Cabrera-Perona, V.; Moriano, J.A. A Longitudinal Analysis of Gambling Predictors among Adolescents. *Int. J. Environ. Res. Public Health* **2020**, *17*, 9266. [\[CrossRef\]](#)
- Männikkö, N.; Ruotsalainen, H.; Tolvanen, A.; Kääriäinen, M. Psychometric properties of the Internet Gaming Disorder Test (IGDT-10) and problematic gaming behavior among Finnish vocational school students. *Scand. J. Psychol.* **2019**, *60*, 252–260. [\[CrossRef\]](#)
- Andreassen, C.; Pallesen, S. Social Network Site Addiction—An Overview. *Curr. Pharm. Des.* **2014**, *20*, 4053–4061. [\[CrossRef\]](#) [\[PubMed\]](#)
- Burleigh, T.L.; Griffiths, M.D.; Sumich, A.; Stavropoulos, V.; Kuss, D.J. A systematic review of the co-occurrence of gaming disorder and other potentially addictive behaviors. *Curr. Addict. Rep.* **2019**, *6*, 383–401. [\[CrossRef\]](#)
- Kakihara, F.; Tilton-Weaver, L. Adolescents' interpretations of parental control: Differentiated by domain and types of control. *Child Dev.* **2009**, *80*, 1722–1738. [\[CrossRef\]](#)
- Boer, M.; Van den Eijnden, R.J.; Boniel-Nissim, M.; Wong, S.-L.; Inchley, J.C.; Badura, P.; Craig, W.M.; Gobina, I.; Kleszczewska, D.; Klanšček, H.J.; et al. Adolescents' Intense and Problematic Social Media Use and Their Well-Being in 29 Countries. *J. Adolesc. Health* **2020**, *66*, S89–S99. [\[CrossRef\]](#)
- Obar, J.; Wildman, S. Social media definition and social media governance challenge: An Introduction to the special Issue. *Telecommun. Policy* **2015**, *39*, 745–750. [\[CrossRef\]](#)
- Winstone, L.; Mars, B.; Haworth, C.M.A.; Kidger, J. Social media use and social connectedness among adolescents in the United Kingdom: A qualitative exploration of displacement and stimulation. *BMC Public Health* **2021**, *21*, 1736. [\[CrossRef\]](#)
- Ryan, T.; Allen, K.A.; Gray, D.L.; McInerney, D. How Social Are Social Media? A Review of Online Social Behaviour and Connectedness. *J. Relatsh. Res.* **2017**, *8*, e8. [\[CrossRef\]](#)
- Keles, B.; McCrae, N.; Grealish, A. A systematic review: The influence of social media on depression, anxiety and psychological stress in adolescents. *Int. J. Adolesc. Youth* **2020**, *25*, 79–93. [\[CrossRef\]](#)
- Karim, F.; Oyewande, A.; Abdalla, L.F.; Ehsanullah, R.C.; Khan, S. Social Media Use and Its Connection to Mental Health: A Systematic Review. *Cureus* **2020**, *12*, e8627. [\[CrossRef\]](#) [\[PubMed\]](#)
- Pontes, H.M. Investigating the differential effects of social networking site addiction and Internet gaming disorder on psychological health. *J. Behav. Addict.* **2017**, *6*, 601–610. [\[CrossRef\]](#) [\[PubMed\]](#)
- Booker, C.L.; Kelly, Y.J.; Sacker, A. Gender differences in the association between age trends of social media interaction and well-being among 10–15 year olds in the UJK. *BMC Public Health* **2018**, *18*, 321. [\[CrossRef\]](#) [\[PubMed\]](#)
- Andreassen, C.S. Online Social Network Site Addiction: A Comprehensive Review. *Curr. Addict. Rep.* **2015**, *2*, 175–184. [\[CrossRef\]](#)
- Bányai, F.; Zsila, Á.; Király, O.; Maraz, A.; Elekes, Z.; Griffiths, M.; Andreassen, C.S.; Demetrovics, Z. Problematic Social Media Use: Results from a Large-Scale Nationally Representative Adolescent Sample. *PLoS ONE* **2017**, *12*, e0169839. [\[CrossRef\]](#)
- Fabris, M.A.; Marengo, D.; Longobardi, C.; Settanni, M. Investigating the links between fear of missing out, social media addiction, and emotional symptoms in adolescence: The role of stress associated with neglect and negative reactions on social media. *Addict. Behav.* **2020**, *106*, 106364. [\[CrossRef\]](#)

19. Boursier, V.; Gioia, F.; Griffiths, M.D. Do selfie-expectancies and social appearance anxiety predict adolescents' problematic social media use? *Comput. Hum. Behav.* **2020**, *110*, 106395. [CrossRef]
20. Griffiths, M.D.; Király, O.; Pontes, H.M.; Demetrovics, Z. An overview of problematic gaming. In *Mental Health in the Digital Age: Grave Dangers, Great Promise*; Aboujaoude, E., Starcevic, V., Eds.; Oxford University Press: Oxford, UK, 2015; pp. 27–45. [CrossRef]
21. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Health Disorders*, 5th ed.; American Psychiatric Association: Washington, DC, USA, 2013.
22. World Health Organization. International Classification of Diseases for Mortality and Morbidity Statistics (11th Revision). 2019. Available online: <https://icd.who.int/browse11/l-m7en> (accessed on 5 May 2021).
23. Delfabbro, P.; King, D.L. Gaming-gambling convergence: Evaluating evidence for the 'gateway' hypothesis. *Int. Gambl. Stud.* **2020**, *20*, 380–392. [CrossRef]
24. Calado, F.; Alexandre, J.; Griffiths, M.D. Prevalence of Adolescent Problem Gambling: A Systematic Review of Recent Research. *J. Gambl. Stud.* **2017**, *33*, 397–424. [CrossRef]
25. Reer, F.; Festl, R.; Quandt, T. Investigating problematic social media and game use in a nationally representative sample of adolescents and younger adults. *Behav. Inf. Technol.* **2021**, *40*, 776–789. [CrossRef]
26. Holstein, B.E.; Pedersen, T.P.; Bendtsen, P.; Madsen, K.R.; Meilstrup, C.R.; Nielsen, L.; Rasmussen, M. Perceived problems with computer gaming and internet use among adolescents: Measurement tool for non-clinical survey studies. *BMC Public Health* **2014**, *14*, 361. [CrossRef] [PubMed]
27. Horváth, Z.; Király, O.; Demetrovics, Z.; Németh, Á.; Várnai, D.; Urbán, R. Polysubstance Use Is Positively Associated with Gaming Disorder Symptom Severity: A Latent Class Analytical Study. *Eur. Addict. Res.* **2022**, *28*, 12–22. [CrossRef] [PubMed]
28. Canale, N.; Vieno, A.; Ter Bogt, T.; Pastore, M.; Siciliano, V.; Molinaro, S. Adolescent gambling-oriented attitudes mediate the relationship between perceived parental knowledge and adolescent gambling: Implications for prevention. *Prev. Sci.* **2016**, *17*, 970–980. [CrossRef]
29. Kapetanovic, S.; Bohlin, M.; Skoog, T.; Gerdner, A. Structural relations between sources of parental knowledge, feelings of being overly controlled and risk behaviors in early adolescence. *J. Fam. Stud.* **2020**, *26*, 226–242. [CrossRef]
30. Molinaro, S.; Benedetti, E.; Scalese, M.; Bastiani, L.; Fortunato, L.; Cerrai, S.; Canale, N.; Chomynová, P.; Elekes, Z.; Feijão, F.; et al. Prevalence of youth gambling and potential influence of substance use and other risk factors throughout 33 European countries: First results from the 2015 ESPAD study. *Addiction* **2018**, *113*, 1862–1873. [CrossRef]
31. Steinberg, L. Risk Taking in Adolescence: What Changes, and Why? *Ann. N. Y. Acad. Sci.* **2004**, *1021*, 51–58. [CrossRef] [PubMed]
32. Hou, Y.; Xiong, D.; Jiang, T.; Song, L.; Wang, Q. Social media addiction: Its impact, mediation, and intervention. *Cyberpsychol. J. Psychosoc. Res. Cyberspace* **2019**, *13*, 4. [CrossRef]
33. Badura, P.; Sigmundova, D.; Sigmund, E.; Geckova, A.M.; Van Dijk, J.P.; Reijneveld, S.A. Participation in organized leisure-time activities and risk behaviors in Czech adolescents. *Int. J. Public Health* **2017**, *62*, 387–396. [CrossRef]
34. Hipwell, A.E.; Murray, J.; Xiong, S.; Stepp, S.; Keenan, K.E. Effects of adolescent childbearing on maternal depression and problem behaviors: A prospective, population-based study using risk-set propensity scores. *PLoS ONE* **2016**, *11*, e0155641. [CrossRef]
35. Raitasalo, K.; Härkönen, J. Nuorten Päihhteiden Käyttö Ja Rahapelaaminen: ESPAD-Tutkimus 2019. Terveysten ja Hyvinvoinnin laitost. 2019. Available online: <http://urn.fi/URN:NBN:fi-fe2019110737026> (accessed on 6 June 2021).
36. SAS Institute, Inc. *SAS/STAT®9.3 User's Guide*; SAS Institute, Inc.: Cary, NC, USA, 2011.
37. Paschke, K.; Austermann, M.I.; Simon-Kutscher, K.; Thomasius, R. Adolescent social media usage before and during the Covid-19 pandemic. *Open Sci. Psychol.* **2021**. [CrossRef]
38. Andreassen, C.S.; Pallesen, S.; Griffiths, M. The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey. *Addict. Behav.* **2017**, *64*, 287–293. [CrossRef] [PubMed]
39. Escario, J.-J.; Wilkinson, A. Exploring predictors of online gambling in a nationally representative sample of Spanish adolescents. *Comput. Hum. Behav.* **2020**, *102*, 287–292. [CrossRef]
40. Lenhart, A. Teen, Social Media and Technology Overview 2015. Pew Research Center. 2015. Available online: <https://www.pewresearch.org/internet/2015/04/09/teens-social-media-technology-2015/> (accessed on 5 June 2021).
41. Baumgartner, S.E.; Van Der Schuur, W.A.; Lemmens, J.S.; Poel, F.T. The relationship between media multitasking and attention problems in adolescents: Results of two longitudinal studies. *Hum. Commun. Res.* **2017**, *44*, 3–30. [CrossRef]
42. Peris, M.; De La Barrera, U.; Schoeps, K.; Montoya-Castilla, I. Psychological Risk Factors that Predict Social Networking and Internet Addiction in Adolescents. *Int. J. Environ. Res. Public Health* **2020**, *17*, 4598. [CrossRef]
43. Aparicio-Martinez, P.; Perea-Moreno, A.J.; Martinez-Jimenez, M.P.; Redel-Macías, M.D.; Pagliari, C.; Vaquero-Abellan, M. Social Media, Thin-Ideal, Body Dissatisfaction and Disordered Eating Attitudes: An Exploratory Analysis. *Int. J. Environ. Res. Public Health* **2019**, *16*, 4177. [CrossRef]
44. Vannucci, A.; Simpson, E.G.; Gagnon, S.; Ohannessian, C.M. Social media use and risky behaviors in adolescents: A meta-analysis. *J. Adolesc.* **2020**, *79*, 258–274. [CrossRef]
45. Przybylski, A.K.; Murayama, K.; DeHaan, C.R.; Gladwell, V. Motivational, emotional and behavioural correlates of fear of missing out. *Comput. Hum. Behav.* **2013**, *29*, 1841–1848. [CrossRef]
46. Brailovskaia, J.; Margraf, J. The relationship between burden caused by coronavirus (COVID-19), addictive social media use, sense of control and anxiety. *Comput. Hum. Behav.* **2021**, *119*, 106720. [CrossRef]

47. Merchant, R.M.; Lurie, N. Social media and emergency preparedness in response to novel coronavirus. *JAMA* **2020**, *323*, 2011–2012. [[CrossRef](#)]
48. Sussman, S.; Rozgonjuk, D.; Van den Eijnden, R.J. Substance and behavioral addictions may share a similar underlying process of dysregulation. *Addiction* **2017**, *112*, 1717–1718. [[CrossRef](#)] [[PubMed](#)]
49. Hemovich, V.; Crano, W.D. Family Structure and Adolescent Drug Use: An Exploration of Single-Parent Families. *Subst. Use Misuse* **2009**, *44*, 2099–2113. [[CrossRef](#)] [[PubMed](#)]
50. Mérelle, S.; Kleiboer, A.; Schotanus, M.; Cluitmans, T.L.; Waardenburg, C.M.; Kramer, D.; van de Mheen, H.; van Rooij, A.J. Which health-related problems are associated with problematic video-gaming or social media use in adolescents? A large-scale cross-sectional study. *Clin. Neuropsychiatry* **2017**, *14*, 119.
51. NIDA. Sex and Gender Differences in Substance Use. 13 April 2021. Available online: <https://www.drugabuse.gov/publications/research-reports/substance-use-in-women/sex-gender-differences-in-substance> (accessed on 17 December 2021).
52. Johnstone, P.; Regan, M. Gambling harm is everybody's business: A public health approach and call to action. *Public Health* **2020**, *184*, 63–66. [[CrossRef](#)]
53. Chung, T.; Sum, S.; Chan, M. Time to call for a global public health approach in prevention of the onset and progression of problematic gaming. *J. Behav. Addict.* **2018**, *7*, 548–552. [[CrossRef](#)]
54. Andreassen, C.S.; Billieux, J.; Griffiths, M.D.; Kuss, D.J.; Demetrovics, Z.; Mazzoni, E.; Pallesen, S. The relationship between addictive use of social media and video games and symptoms of psychiatric disorder: A Large-scale cross-sectional study. *Psychol. Addict. Behav.* **2016**, *30*, 252–262. [[CrossRef](#)]
55. Hibell, B.; Guttormsson, U.; Ahlström, S.; Balakireva, O.; Bjarnason, T.; Kokkevi, A.; Kraus, L. *2011 ESPAD Report: Substance Use among Students in 36 European Countries*, Swedish Council for Information on Alcohol and Other Drugs, Stockholm, European Monitoring Centre for Drugs and Drug Addiction, Council of Europe, Cooperation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (Pompidou Group); The Swedish Council for Information on Alcohol and Other Drugs: Stockholm, Sweden, 2012.