Association between excessive Internet use and oral health behaviors of Korean adolescents: A 2015 national survey

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Objective: This study aimed to investigate excessive Internet use's (EIU's) association with oral health behaviors among Korean adolescents. *Basic research design:* This cross-sectional study was based on the 11th Korea Youth Risk Behavior Web-based Survey (2015). *Participants:* 68,043 school students aged 13-18 years (35,204 boys and 32,839 girls). Data on, 45,271 (23,354 males and 21,917 females using the Internet on weekdays) and 49,324 (27,448 males and 21,876 females using the Internet on weekends) were analyzed after excluding questionnaires with missing values. *Main outcome measures:* The key variables were oral health behaviors (tooth-brushing frequency and tooth brushing after lunch at school, and preventive oral health behaviors), EIU (hours of Internet use on weekdays and weekends, excluding use for academic purposes). *Results:* Compared to the general groups, the odds ratio (OR) for less tooth-brushing was 4.04 (95%CI=2.990–5.459) and 3.55-fold higher (95% CI=2.703–4.659) in the high-risk groups for weekday and weekend EIU, respectively. For post-lunch tooth-brushing, compared to the general groups, the OR for less tooth-brushing was 1.7-fold higher in the high-risk groups for EIU during weekdays and weekends. The OR for no preventive behavior was significantly higher in the high-risk groups than in the potential-risk and general groups. *Conclusions:* Policies moderating adolescents' EIU may enable appropriate oral health behaviors.

Key words: Adolescents, Excessive internet use, Oral health behaviors

Introduction

Oral health-related behaviors, including regular tooth-brushing with fluoride toothpaste, examination and preventive treatments (scaling, sealants, and fluoride treatment), are important determining factors for oral health and form the basis for healthy living (Do, 2016). Several studies have reported that maintaining optimal oral hygiene is closely related to the prevention of chronic gingivitis. In particular, regular tooth-brushing with a fluoride toothpaste has been shown to reduce the incidence and progression of dental caries and chronic periodontitis. Zimmermann *et al.*'s (2015) systematic review investigated the relationship between the frequency of brushing teeth and chronic gingivitis. Meta-analysis showed that the odds ratio of infrequent tooth-brushing was 1.44 times (all summary estimates, fixed and random effect model) higher for chronic periodontitis than for frequent brushing. In contrast, poor oral health-related habits may negatively affect gingivitis, periodontitis and halitosis. Moreover, the tooth pain associated with these oral diseases results in adolescents leaving school early or absence from school, interfering with their daily lives (Lim and Oh, 2013). Further, Aimée *et al.* (2016) reported that untreated caries in anterior teeth could lower adolescents' self-esteem, who are self-conscious about their appearance and highly sensitive, while also lowering oral health-related quality of life. Thus, research and interventions are required to promote appropriate oral health behaviors in adolescents.

Today, Internet use has become an essential factor in daily life in terms of education, culture, economics, information acquisition, work, social interaction, and entertainment (Kim *et al.*, 2010). Since nationwide Internet accessibility was granted in South Korea in 1994, its use has increased dramatically, increasing threefold in 2011 to 78%. The fact that 99.9% of adolescents access the Internet through smartphones requires further attention (Yoo *et al.*, 2014). This is a worldwide phenomenon. Moreover, although Internet accessibility has improved convenience, it has also led to serious problems, including Internet addiction and Problematic Internet Use (PIU) (Heo *et al.*, 2014). Internet addiction, referring to individuals' loss of control over their Internet use and impaired functioning in daily living (Do, 2016; Ha *et al.*, 2007), could negatively affect physical and mental health (Kelley and Gruber, 2013; Park, 2014). According to previous studies, PIU is accompanied by other mental health problems, such as depression, poor self-esteem, self-inflicted physical injuries, and suicidal thoughts (Lam *et al.,* 2009; Park *et al.*, 2013; Yoo *et al.,* 2014). It also results in lack of exercise, in turn leading to obesity; increases smoking and alcohol consumption; and leads to physical pain, including myalgia, shoulder pain, and headaches (Barrense-Dias *et al.*, 2016; Ha *et al.*, 2007; Kelley and Gruber, 2013; Mei *et al.*, 2016; Park *et al.*, 2013). Particularly, excessive night-time Internet use (EIU) decreases sleeping hours, leading to fatigue and interfering with students' academic life (Choi

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et al., 2009). Thus, adolescents' EIU could discourage their oral health behaviors, negatively influencing oral health. Therefore, risk factors with a detrimental effect on oral health behavior must be identified as potential causes of oral disease. However, most studies have addressed psychological and psychiatric problems only (An *et al.*, 2014; Blachnio *et al.*, 2015; Choi *et al.*, 2009; Ha *et al.*, 2007; Park *et al.*, 2013). Although studies have recently investigated the relationship between EIU and physical health (An *et al.*, 2014; Barrense-Dias *et al.*, 2016; Kelley and Gruber, 2013), an investigation of its association with oral health (e.g., oral health-related behaviors, and oral disease) is rare. Moreover, findings have been inconsistent, with most studies examining small samples, limiting generalizability. Thus, the present study investigated EIU's association with adolescents' oral health behaviors, using data from the 11th Korea Youth Risk Behavior Web-based Survey (2015), a nationally representative study.

Methods

Participants

The study utilized data from the 11th Korea Youth Risk Behavior Web-based Survey (2015), conducted annually by the Ministry of Health and Welfare, Ministry of Education, and Korea Centers for Disease Control and Prevention, on South Korean adolescents' health behaviors. This survey is conducted anonymously on middle and high school students through self-reported online questionnaires. To establish the sample frame, data collected from middle and high schools across the country as of April 2014 were used. The sampling procedure used population stratification, sample allocation, and sampling. In population stratification, to decrease the sampling error, 44 regions and 3 school types (middle school, general high school, and specialized vocational high school) were used as stratification variables to divide the population into 132 subpopulations. In sample allocation, the sample size was determined as 400 middle schools and 400 high schools. For 17 cities and provinces, 5 middle schools and 5 high schools were allocated first. Stratified cluster sampling was used; the primary sampling unit was the school while the secondary unit was the class. Among classes selected in secondary sampling, 1 class was selected randomly; all students in the class were selected. Those who had been absent for prolonged periods, with special needs, and with impaired literacy were excluded. More details about the nationwide survey sampling and process are available elsewhere (KCDCP, 2015).

The survey was conducted with 70,362 students from 400 middle and 400 high schools across South Korea. The final participation rate was 96.7%, with 68,043 students' data from 797 schools (35,204 males; 32,839 females). Finally, the data for 45,271 (23,354 males) using the Internet on weekdays and 49,324 (27,448 males) using the Internet on weekends adolescents were analyzed. The KYRBS, a government-approved survey (approval number 11758), was reviewed by the Korea Centers for Disease Control and Prevention's (2014-06EXP-02-P-A) institutional review board, and conducted upon obtaining consent from the participants.

Measurements

Participants' general characteristics, including gender, grade, academic achievement, perceived family economic status, father's education, mother's education, and current alcohol consumption and smoking patterns were obtained. The variables used in this study were extracted from the KYRBWS questionnaire for the 11th (2015) year and the variables were re-categorized according to the purpose of this study (KCDCP, 2015).

Self-perceived academic achievement and economic status were assessed with responses classified into "high," "middle," and "low" (originally "high," "upper-middle," "middle," "low-middle," and "low"). Parents' education level was classified into "middle school and below," "high school," "university (including college)," and "unknown." Alcohol and tobacco consumption in the past 30 days were each coded as 'None' or 'Yes'.

Participants' reported Internet use, other than for academic purposes, on weekdays (Monday–Friday) and weekends (Saturday–Sunday) was considered in the following categories: a "general group" for those with <2 hours' Internet use, a "potential risk group" for those with 2–4 hours' use, and a "high-risk group" for those >4 hours' use (Ministry of Science, ICT and Future Planning 2015).

Oral health behavior, the dependent variable, was divided into tooth-brushing frequency on the previous day and after lunch at school, and oral health preventive behaviors (sealants, scaling, and other auxiliary oral care products). The first two were measured as "none," "1–2 times," and "more than 3 times"; and "none," "sometimes," and "every day," respectively. Preventive behaviors specifically referred to receipt of sealants or scaling treatment in the past 12 months and were measured as "yes" or "no." Non-use of auxiliary oral care products was classified as "no"; use of dental floss, interdental brushes, mouthwash, or electric toothbrushes was classified as "yes." Taking the three preventive behaviors together, 0 was classified as "No"; 1–3 were classified as "Yes"(KCDCP, 2015).

Statistical Analysis

All analyses were conducted using a complex sample analysis module that considers stratification variables, cluster variables, and weights.

Rao-Scott chi-squared tests investigated differences on weekdays and weekends according to general characteristics and whether oral health behaviors differed according to EIU. To examine EIU's potential association with oral health behaviors, multinomial logistic regression for complex samples was conducted to obtain the odds ratios (ORs) and 95% confidence intervals (CI) after adjusting for covariates (gender, grade, academic achievement, perceived family economic status, father's education, mother's education, alcohol consumption, and smoking). The collected data were analyzed using PASW statistics 18.0 ver. (IBM Co., Armonk, NY, USA). Significance was set at <0.05.

Results

For weekday EIU, more male students were in the high and potential risk groups (8.4% and 40.6% respectively) than females (7.1% and 33.8%, *p* <0.001, Table 1). Students in the second grade of middle school (9.3%), followed by those in the third grade (9.1%), had the highest representation in the high-risk group; thus, middle school students were at a higher risk of EIU than high school students (P<0.001). More low academic achievers (11.8%) were in the high-risk group than high achievers (5.2%). More students with a low perceived family economic status (10.5%) (P<0.001) were in the high-risk group. Classification in the high-risk group increased when parents' education level was lower (P<0.001). More students currently consumed alcohol in the high-risk group (10.5%) than those not consuming alcohol and more currently smoking students (13.4%) were in the high-risk group than non-smokers (7.4%, P<0.001, Table 1).

For weekend EIU, more male (25.7%) than female students (19.5%) were in the high-risk group. More students were in the high-risk group at weekends than on weekdays (males: 8.4%; females: 7.1%). Third-grade students in middle school had the highest representation in the high-risk group, at 24.6% (P<0.001). Low academic achievers (29.7%) had the highest representation in the high-risk group. Representation in the high-risk group was at 31.3% for students with a low

perceived family economic status, almost twice that of students with a high perceived family economic status (18.6%) (P<0.001). The prevalence of high-risk for weekend EIU was higher when parents' education level was lower (P<0.001), incurrent alcohol consumers and smokers (28.3% and 31.6%, respectively, P<0.001, Table 2).

On weekdays, 52.4% of students in the general group reported brushing their teeth >3 times per day, compared to 43.6% and 39.6% of the potential–risk and high–risk groups (P<0.001). During weekends, 56.1% of the general group reported brushing their teeth >3 times a day, compared to 47.8% and 39.7% of the potential-risk and high–risk groups (P<0.001). Similarly, frequency of brushing after lunch and other preventive behaviours decreased with greater internet use (both P<0.001, Table 3).

To investigate the relationships between EIU and oral health behaviors, participants' general characteristics (gender, grade, academic achievement, perceived family economic status, mother's education, father's education, alcohol consumption, and smoking) were adjusted, after which multinomial logistic regression was conducted. In general, tooth-brushing frequency, lunchtime brushing and other preventive behaviours were more adverse with greater internet use at weekends and on weekdays (Table 4) For example, the OR for no daily tooth-brushing was 4.04-fold higher (95% CI=2.990–5.459) than brushing >3 times daily in the high-risk group for weekday EIU.

Table 1. Weekday internet use by general characteristics (N=45,271)

Variable	Category	Excessive Internet Use (weekdays) N (weighted %)			P
		General group	Potential-risk group	High-risk group	
Gender	Boys	12,005 (51.0)	9,382 (40.6)	1,967 (8.4)	<0.001
	Girls	12,968 (59.1)	7,343 (33.8)	1,606 (7.1)	
Grade	Middle school 1st	4,473 (60.7)	2,336 (31.4)	605 (7.9)	
	Middle school 2nd	4,102 (52.8)	3.009 (37.9)	724 (9.3)	
	Middle school 3rd	4,089 (49.5)	3,409 (41.5)	758 (9.1)	<0.001
	High school 1st	4,071 (57.3)	2,486 (36.3)	449 (6.4)	
	High school 2nd	3,915 (53.6)	2,759 (39.0)	525 (7.3)	
	High school 3rd	4,323 (56.7)	2,726 (36.5)	512 (6.8)	
Academic achievement	High	11,403 (62.6)	5,801 (32.2)	979 (5.2)	
	Middle	7,030 (55.8)	4,653 (37.4)	876 (6.8)	<0.001
	Low	6,540 (44.6)	6,271 (43.6)	1,718 (11.8)	
Perceived family economic status	High	9,772 (59.4)	5,475 (34.1)	1,076 (6.5)	
	Middle	11,580 (54.4)	7,956 (37.8)	1,690 (7.8)	<0.001
	Low	3,621 (46.5)	3,294 (43.0)	807 (10.5)	
Father's education	≤Middle school	556 (48.2)	440 (38.6)	147 (13.2)	
	High school	6,644 (52.8)	4,897 (39.2)	1,029 (7.9)	<0.001
	University (college)	13,406 (58.5)	7,760 (34.9)	1,453 (6.5)	
	Unknown	3,602 (48.8)	2,967 (41.1)	744 (10.0)	
Mother's education	≤Middle school	489 (50.6)	380 (37.9)	108 (11.5)	
	High school	8,488 (53.6)	6,042 (38.5)	1,271 (8.0)	<0.001
	University (college)	11,899 (58.8)	6,851 (34.8)	1,278 (6.4)	
	Unknown	3,480 (49.0)	2,852 (40.8)	733 (10.2)	
Alcohol consumption	No	21,728 (56.3)	13,889 (36.5)	2,857 (7.3)	<0.001
	Yes	3,245 (47.5)	2,836 (42.0)	716 (10.5)	
Current smoking	No	23,827 (55.9)	15,419 (36.7)	3,191 (7.4)	<0.001
	Yes	1,146 (40.7)	1,306 (46.0)	382 (13.4)	

The data were analyzed using Rao-Scott chi-squared test; Significance level: P<0.05

Table 2. Weekend internet use by general characteristics (N=49,324)

Variable	Category	Excessive Internet Use (weekends) N (weighted %)			P
		General group	Potential-risk group	High-risk group	
Gender	Boys	5,990 (22.0)	14,307 (52.4)	7,151 (25.7)	<0.001
	Girls	8,261 (38.0)	9,289 (42.6)	4,326 (19.5)	
Grade	Middle school 1st	2,851 (37.7)	3,342 (43.3)	1,541 (19.1)	
	Middle school 2nd	2,296 (28.7)	3.876 (46.8)	2,087 (24.5)	
	Middle school 3rd	2,237 (25.9)	4,270 (49.6)	2,186 (24.6)	
	High school 1st	2,272 (26.9)	4,150 (49.8)	1,949 (23.3)	<0.001
	High school 2nd	2,059 (25.2)	4,141 (50.7)	1,968 (24.1)	
	High school 3rd	2,536 (31.8)	3,817 (46.8)	1,746 (21.4)	
Academic achievement	High	6,567 (33.9)	9,304 (47.6)	3,686 (18.4)	
	Middle	3,952 (29.0)	6,865 (49.7)	3,011 (21.4)	<0.001
	Low	3,732 (23.1)	7,427 (47.1)	4,780 (29.7)	
Perceived family economic status	High	5,890 (33.6)	8,363 (47.8)	3,350 (18.6)	
	Middle	6,483 (27.9)	11,377 (48.8)	5,527 (23.3)	<0.001
	Low	1,878 (22.3)	3,856 (46.4)	2,600 (31.3)	
Father's education	≤Middle school	250 (20.1)	567 (45.7)	420 (34.4)	
	High school	3,505 (25.5)	6,720 (48.4)	3,645 (26.1)	
	University (college)	8,007 (32.7)	11,759 (48.5)	4,598 (18.7)	<0.001
	Unknown	2,068 (25.4)	3,768 (47.0)	2,253 (27.6)	
Mother's education	≤Middle school	226 (21.5)	514 (48.3)	310 (30.1)	
	High school	4,597 (26.7)	8,423 (48.1)	4,390 (25.2)	<0.001
	University (college)	7,101 (32.9)	10,394 (48.7)	4,026 (18.4)	
	Unknown	1,989 (25.3)	3,857 (46.4)	2,244 (28.3)	
Alcohol consumption	No	12,615 (30.4)	19,864 (47.7)	9,323 (21.9)	<0.001
	Yes	1,636 (21.8)	3,732 (49.9)	2,154 (28.3)	
Current smoking	No	13,655 (29.8)	21,992 (47.9)	10,447 (22.3)	<0.001
	Yes	596 (18.7)	1,604 (49.7)	1,030 (31.6)	

The data were analyzed using Rao-Scott chi-squared test; Significance level: P<0.05

Discussion

Excessive Internet use among adolescents has become a serious public health problem (Ministry of Science and ICT Future Planning, 2015).

In this study, more males and middle school students were at greater risk of addiction. This matches the report by the South Korean Ministry of Science, ICT, and Future Planning (2015). In Heo *et al.*'s (2014) study, the Internet addiction rate was higher in male students, increasing per grade among middle school students; an opposite trend was observed among high school students. Park *et al.* (2013) observed EIU in male students increased by 0.8% and 5.5% in female students. The authors attributed this recent increase in female Internet use to social networking services (SNS), Facebook, shopping, and forming interpersonal relationships in the virtual world. This suggests that the purpose of use and the mechanism of Internet addiction may differ in male and female students, and that influences on their health would also differ. This observation necessitates a more detailed investigation.

In the present study, the high-risk group for EIU had poorer oral health behaviors than the general group

Previous studies proposed have biological mechanisms behind the association between oral health and mental health problems, including stress, anxiety, and depression (Davies *et al.*, 2016; Delgado-Angulo *et al.*, 2015; Dumitrescu, 2016). EIU might be lead to stress and depression, which could discourage oral health behaviors, (Dumitrescu, 2016; Reners and Brecx, 2007). Elhai *et al.* (2017) reported that problematic smartphone use interfered with daily living, decreasing focus and dedication to academic achievement, and accompanied by problems, such as anxiety, depression, and suicidal thoughts. In another study, EIU was associated with insomnia, which could cause irregular sleeping habits and daytime sleepiness, eventually leading to excessive fatigue (Tan *et al.*, 2016). The use of electronic media, including the Internet, replaces sleeping hours and causes sleep deprivation, and excessive use increases psychological problems, including excessive excitement, stimulation, and arousal (Cain and Gradisar, 2010; Cain *et al.*, 2011). Further, long-term exposure to bright light delays the body's circadian rhythms, eventually inducing poor sleeping habits (Becker *et al.*, 2015). In turn, sleep deprivation may reduce salivary flow, increasing bacterial count and plaque formation. This could further cause dental caries, halitosis, and poor oral health conditions (Acar *et al.*, 2015; Källestål and Matsson, 1990;

Table 3. Oral health behaviors by internet use

Variable	Tooth-Brushing Frequency N (weighted %)			P
	None	*1–2 times*	*≥3 times*	
Internet use (weekdays)				
General group	135 (0.5)	11,589 (47.0)	13,249 (52.4)	
Potential-risk group	182 (1.0)	9,192 (55.4)	7,351 (43.6)	<0.001
High-risk group	83 (2.1)	2,030 (58.3)	1,460 (39.6)	
(weekends)				
General group	76 (0.5)	6,165 (43.4)	8,010 (56.1)	
Potential-risk group	147 (0.6)	12,049 (51.6)	11,400 (47.8)	<0.001
High-risk group	210 (1.8)	6,630 (58.6)	4,637 (39.7)	
	Tooth-Brushing After Lunch			
	None	Sometimes	Everyday	
Internet use (weekdays)				
General group	9,206 (38.1)	8,920 (35.4)	6,847 (26.5)	
Potential-risk group	7,624 (46.8)	5,573 (32.8)	3,528 (20.4)	<0.001
High-risk group	1,794 (51.9)	1,098 (30.2)	681 (17.9)	
(weekends)				
General group	4,847 (34.9)	5,202 (36.2)	4,202 (28.9)	
Potential-risk group	9,757 (42.8)	8,431 (35.1)	5,408 (22.0)	<0.001
High-risk group	5,590 (49.8)	3,575 (30.9)	2,312 (19.4)	
	Preventive Behaviors			
	No	Yes		
Internet use (weekdays)				
General group	15,010 (59.9)	9,963 (40.1)		
Potential-risk group	10,608 (63.4)	6,117 (36.6)		<0.001
High-risk group	2,328 (65.0)	1,245 (35.0)		
(weekends)				
General group	8,487 (59.2)	5,764 (40.8)		
Potential-risk group	14,793 (62.7)	8,803 (37.3)		<0.001
High-risk group	7,423 (64.5)	4,054 (35.5)		

The data were analyzed using Rao-Scott chi-squared test; Significance level: P<0.05

Table 4. Logistic regression models for pattern of internet use

Variable	Potential VS. GP[1] AOR (95%CI)[2]	High Risk VS. GP AOR (95%CI)	Potential VS. GP AOR (95%CI)	High risk VS. GP AOR (95% CI)
	(weekdays)		*(weekends)*	
Tooth-brushing frequency				
≥3times (reference)	1	1	1	1
1–2 times	1.307 (1.255-1.361)	1.444 (1.322-1.565)	1.244 (1.191-1.298)	1.625 (1.541-1.715)
None	1.979 (1.571-2.493)	4.040 (2.990-5.459)	1.154 (0.860-1.548)	3.549 (2.703-4.659)
Tooth-brushing after lunch				
Every day (reference)	1	1	1	1
Sometimes	1.133 (1.070-1.199)	1.104 (0.983-1.241)	1.129 (1.064-1.199)	1.088 (1.008-1.176)
None	1.473 (1.380-1.571)	1.706 (1.517-1.919)	1.335 (1.252-1.424)	1.703 (1.567-1.850)
Preventive behaviors				
Yes (reference)	1	1	1	1
No	1.076 (1.033-1.122)	1.117 (1.034-1.207)	1.046 (1.001-1.094)	1.071(1.014-1.131)

GP[1]: General Group (reference)
AOR(95%CI)[2]: Adjusted Odds Ratio (95% Confidence Interval); Adjusted for gender, grade, academic achievement, perceived family economic status, father's education, mother's education, alcohol, smoking.
The data were analyzed using multiple nominal logistic regression.

Storhaug and Holst, 1987). Carra *et al.* (2016) reported that periodontal infection risk was 1.25-fold higher in subjects with sleep disturbance than in others, and a recent study by Do (2016) demonstrated that risk for oral symptoms was 1.25-fold higher in adolescents using the Internet for >7 hours, when compared to those using it for <1 hour, thus supporting the present findings (Do, 2016).

Therefore, since EIU might indirectly harm oral health and as a risk factor discouraging adolescents' oral health behaviors, investigation of these two factors is very important. However, few studies have investigated the association between EIU and oral health, and related evidence that can support the present findings is lacking. Moreover, positive aspects of appropriate Internet use would require further investigation. Further, scientific evidence suggesting the standards for appropriate Internet use should be collected, to prepare an international standard index that screens for high-risk EIU.

This study has shown that excessive Internet use is related to adolescents' oral health behavior. Since the present study is cross-sectional, it does not indicate a direct causal relationship between EIU and oral health behaviors. Moreover, as only Internet usage for purposes other than academic on weekdays and weekends were used to measure EIU, the present study may have limited internal validity. Nevertheless, Internet usage hours are reportedly strong risk factors that increase Internet addiction and the most important predicting index of Internet addiction (Yoo *et al.*, 2014). This original study elucidated EIU's association with oral health behaviors, using data collected from a government-approved survey representing South Korean adolescents and is therefore generalizable to all South Korean adolescents. Moreover, the study established the basis for further scientific evidence in related fields. Future studies should investigate EIU's association with oral health, using measurement tools of known validity and reliability, to evaluate adolescents' EIU more accurately. Moreover, prospective cohort and longitudinal studies that can elucidate the direct causal relationship and time relationship between the two factors should also be conducted.

Conclusion

This study showed that the high-risk groups for weekday and weekend EIU had higher risks of less frequent tooth-brushing and post-lunch tooth-brushing, and adoption of preventive oral health behaviors, compared to the general groups, suggesting that adolescents with EIU had poorer oral health behaviors. Adolescents and their parents might take note of EIU's potential to negatively influence health. Moreover, appropriate health behaviors should be promoted. Policies moderating adolescents' EIU may enable appropriate oral health behaviors.

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Appendix

Appendix 1. Describing scales used to assess alcohol consumption, smoking, and EIU

Variable	Questionnaires	Original category	Re-classified
Alcohol consumption	"In the past 30 days, on how many days did you consume 1 or more glasses of alcohol?"	1. None 2. 1–2 days per month 3. 3–5 days per month 4. 6–9 days per month 5. 10–19 days per month 6. 20–29 days per month 7. Every day	No (1. none) Yes (Yes to 2–7)
Current smoking	"In the past 30 days, on how many days did you smoke at least 1 cigarette?"	1. None 2. 1–2 days per month 3. 3–5 days per month 4. 6–9 days per month 5. 10–19 days per month 6. 20–29 days per month 7. Every day	No (1. none) Yes (Yes to 2–7)
Excessive Internet Use	It was assessed in terms of hours of Internet use on weekdays and weekends, excluding use for academic purposes. "In the past 30 days, for how many hours on average did you use the Internet?"	Continuous variable self-reported hours and minutes	Categorical variable 1. General group; For those with less than 2 hours 2. Potential group: 2–4 hours 3. High-risk group: >4 hours