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Problematic Internet Use: Pre-Pandemic Scale of the Phenomenon Among Adolescents in the Three Visegrad Countries (Czech Republic, Poland, Slovakia)

Abstract

The increased time spent using the Internet and smartphones is prevalent primarily among adolescents. This group is currently of particular interest to media educators and psychologists studying the impact of ICTs on quality of life. An example of the negative changes associated with the intensive computerisation of various spaces is the uncontrolled and inadequate use of the Internet, referred to as problematic Internet use (PUI). This text contributes to the discussion on the extent of PUI among adolescents (12–16 years) in the Czech Republic (N=1555), Poland (N=501), and Slovakia (N=478). Based on the collected data, it was found that: 1) Polish and Czech adolescents are similar in terms of the intensity of PUI symptoms (adolescents from Slovakia are characterised by lower levels of PUI); 2) The vast majority of young people do not exceed PUI thresholds that could be considered alarming; 3) Lack of sleep or neglecting meals in favour of Internet use are the least frequent factors in the study group; 4) Most often adolescents declare that they are bored when they do not have access to the Internet; 5) Adolescents are a nonhomogeneous group in terms of the intensity of occurrence of PUI traits, but only 0.3% of adolescents in the Czech Republic and 0.4% in Poland had all 6 PUI factors present in maximum intensity.

Keywords: *problematic use of the Internet, Internet addiction, youths, Czech Republic, Poland, Slovakia, Visegrad countries*

1. Introduction

New media form a space for socialisation and development. Adolescents predominantly use the Internet for communication and entertainment. For this group, the Net is a crucial space for everyday functioning (Pyżalski et al., 2019; Ptaszek et al., 2020). However, recently, one can notice an important trend in new media use. The Internet is mostly mobile, and adolescents use smartphones for almost all educational or leisure activities. This mode of use raises concerns about the boundary between appropriate and inappropriate use of technology (Tandon et al., 2021; Dvoryanchikov et al., 2020).

Several terms to describe adverse phenomena related to excessive ICT use are common in the literature. Such phenomena include, for example, FOMO (Tomczyk & Selmanagic-Lizde, 2018), nomophobia (Anshari et al., 2019), and phubbing (Yildirim & Correia, 2015). Recently the term problematic internet use (PUI) is becoming an umbrella term that is commonly accepted (Marci et al., 2021; Spada, 2014).

Adolescents are particularly at risk of problematic Internet use (Moreno et al., 2011; Özaslan et al., 2021; Villanueva-Blasco et al., 2021). This text addresses the analysed phenomenon by narrowing the data to three Visegrad countries: the Czech Republic, Slovakia, and Poland (Smahel et al., 2020). Furthermore, data from Central and Eastern Europe (CEE) collected in the pre-pandemic era as part of the activities of the EU Kids Online network will capture a critical moment in the development of the information society (Ziemba & Eisenhardt, 2021). Due to the historicity and uniqueness of the data, this text fills a gap related to comparative research. It shows the PUI phenomenon from a critical perspective in relation to existing narratives and stereotypes on the prevalence of internet addiction among adolescents.

2. Theoretical Framework and Research Overview

In 2019, 94% of people aged 16 to 29 in the EU used the Internet daily (Eurostat, 2020). It is often underlined that the Internet is constantly overused, especially by the young generation. In analyses, several indicators are commonly considered, e.g., the time of using digital media (albeit this aspect is a subject of criticism) or problems with digital well-being and its health consequences.

In 1996, Young proposed diagnostic criteria for so-called 'Internet addiction'. She followed the DSM-IV definition for addiction to substances due to several similar-

ities, such as the presence of tolerance (the need for a more significant amount of substance needed to reach a similar effect) and retraction (experienced disorder as a response to reducing or completely withdrawing the substance) (Young, 1996). When other researchers (e.g., Griffiths, 1996) defined problematic Internet use as a behavioural addiction without dope, Young modified her definition by adjusting the DSM-IV criteria for pathological gambling and impulse control disorder as a basis for her Internet Addiction Test (Young, 1998).

Shapira et al. (2003) proposed a more inclusive diagnostic scheme. They argued that definitions based solely on substance addiction or pathological gambling were too narrow to capture the problematic population of Internet users and could lead to incorrect conclusions. They deliberately avoided the term „Internet addiction” and postulated the less controversial term „problematic Internet use” as a) a maladaptive preoccupation with Internet use (longer than intended), b) significant stress or behavioural impairment; and c) no other problems within the ‚Axis I’ that could explain behaviour, such as mania or hypomania.

In our study, we define the term Problematic Internet Use (PUI) as the ‚excessive and/or improper use of the Internet, which can cause psychological, social, academic and/or professional problems’ (Laconi et al., 2019; Tomczyk et al., 2020).

The following PUI criteria are commonly used in recent studies: fear regarding the level of addiction, reducing resting time to use the Internet instead, the perception of life without the Internet, being permanently logged in in free time, spending ever-growing periods online, the feeling of being bored without being able to be online (Dworzański et al., 2009; Rębisz & Sikora, 2016; Tomczyk et al., 2020).

PUI brings serious consequences – it may cause depression, dysfunctional social relationships and other mental disorders (Dalbudak et al., 2013; Park et al., 2013; Fuchs et al., 2018; Restrepo et al., 2020). Also, attention difficulties, psychomotor dysregulation, and suicidal ideation are related to PUI (Moreno et al., 2015). Wang et al. (2021) research show that PUI was associated with decreased sleep quality and mental stress. A cross-sectional study involving 11,356 European young people (ca. 15 y.o.) by Kaess et al. (2014) found that pathological Internet use is related to hyperactivity difficulties and suicidal ideation and attempts. PUI was positively associated with depressive disorders, the combined presentation of ADHD, Autism Spectrum Disorder, and increased sleep disturbances, even when adjusting for demographic covariates and psychiatric comorbidities (Restrepo et al., 2020).

The results also indicate that the social environment can prevent PUI, mainly by maintaining and developing solid social integration and family relations (Dahl & Bergmark, 2020; Hayixibayi et al., 2021; Lukavska et al., 2020).

In the studies of Yamada et al. (2021), the prevalence of PUI was 4.2%. PUI was significantly associated with skipping breakfast, physical inactivity, late bedtime, no rules at home, weak child-parent connections and no close peers.

3. Research Methodology

3.1. Aim of the Study

The purpose of the study is to compare the scale of PUI in youth in three Visegrad countries (Czech Republic, Poland, Slovakia).

The data of this study is part of the big EU Kids Online survey conducted by the EU Kids Online network (Smahel et al., 2020; Zlamal et al., 2020). The present research is unique not only because of the historical value of the data but also because of the possibility of comparing Internet use patterns in three neighbouring CEE countries in the pre-pandemic period. The study adopted the operationalisation based on Griffiths's (2000) typology of symptoms that form excessive Internet use syndrome (referred to as problematic Internet use in our paper).

What is the scale of PUI among adolescents from three Visegrad countries?

What is the degree of cooccurrence of symptoms that define PUI?

To what extent gender differentiates PUI levels?

3.2. Research Tool

The survey tool covering a wide range of online risks and opportunities was constructed by the EU KIDS ONLINE network researchers and translated into the languages of all participating countries (Smahel et al., 2020; Zlamal et al., 2020). The part of the tool measuring PUI consisted of six items presenting symptoms on a 5-point Likert scale for self-report of frequency: 1 – Not at all to 5 – Daily or almost daily. Respondents indicated the frequency during the previous 12 months. The scale had the following Cronbach alphas: Czech Republic (0.769), Poland (0.832), and Slovakia (0.889). Exploratory Factor Analysis (EFA) for the scale was performed separately for each country (Table 1).

Table 1. EFA for PUI

	Czech Republic	Poland	Slovakia
Overall, MSA / Factor loadings			
PUI 1 I have gone without eating or sleeping because of the Internet	0.816 / 0.512	0.899 / 0.652	0.934 / 0.631
PUI 2 I have felt bothered when I cannot be on the Internet	0.820 / 0.627	0.846 / 0.697	0.902 / 0.771
PUI 3 I have caught myself using the Internet, although I'm not really interested	0.830 / 0.574	0.838 / 0.719	0.904 / 0.773
PUI 4 I have spent less time than I should with either family, friends or doing schoolwork because of the time I spent on the Internet	0.798 / 0.774	0.848 / 0.776	0.889 / 0.810
PUI 5 I have tried unsuccessfully to spend less time on the Internet	0.850 / 0.522	0.886 / 0.577	0.920 / 0.764
PUI 6 I have experienced conflicts with family or friends because of the time I spent on the Internet	0.814 / 0.636	0.829 / 0.640	0.876 / 0.812
Bartlett's test			
X ²	2105.536	1016.423	1474.210
Df	15.000	15.000	15.000
P	< .001	< .001	< .001
Chi-squared Test			
Model value	121.332	54.198	25.601
Df	9	9	9
P	< .001	< .001	< .001
One factor characteristics			
SumSq. Loadings	2.214	2.772	3.489
Proportion var.	0.369	0.462	0.582
Cumulative	0.369	0.462	0.582

Exploratory Factor Analysis confirmed a one-dimensional model for all countries.

3.3. Sample

The analyses included responses from adolescents aged 12–16, a total of 2,534 individuals: 1555 in the Czech Republic, 501 in Poland, and 478 in Slovakia (Table 2).

Table 2. Characteristics of the research sample

		Czech Republic		Poland		Slovakia	
N		1555		501		478	
Age	Mean	14.1		13.6		14.1	
	Std. Deviation	1.426		1.392		1.426	
		n	%	n	%	n	%
Gender	Boys	787	50.61	215	42.91	223	46.65
	Girls	768	49.39	286	57.09	255	53.35

3.4. Research Procedure and Ethics

The research was conducted as part of the international comparative survey of the EU Kids Online (Smahel et al., 2020; Zlamal et al., 2020). Data in the Czech Republic was collected between October 6, 2017, and February 9, 2018, at random using an online web-based survey. Children and adolescents provided their answers on school grounds (Bedrošová et al., 2018). The Polish research sample was also randomly collected. Responses were given by students from 90 schools in 2018 using online tools filled in on school premises (Pyżalski et al., 2019). The Slovak research sample was also collected in the first half of 2018 using CAPI (Computer Assisted Personal Interview) in the household sample (Israel et al., 2020; Zlamal et al., 2020).

The study was conducted according to high-quality, ethical guidelines. Consent from parents/guardians and respondents, as well as the permission of school headmasters, has been required. The research was conducted in a way that protects the sensitive data of children and young people. The collected data from the three countries were processed and made available as research reports in national languages (Bedrošová et al., 2018; Pyżalski et al., 2019; Israel et al., 2020), as well as a public report summarising the results of all 19 participating countries (Smahel et al., 2020).

4. Results

Based on the mode and median analysis, it is noted that in most cases, 6 PUI indicators are rarely at the greatest extent. Considering the standard deviation parameter, it is noted that these phenomena oscillate around the left side of the Likert scale (never too rarely). The PUI phenomenon is not normally distributed, as evidenced by the result of the Shapiro-Wilk test (Table 3).

Table 3. Descriptive statistics for the six PUI items

Item	Country	Mode	Median	Mean	Std. Deviation	Skewness	Shapiro-Wilk	P-value of Shapiro-Wilk
PUI1	Czech Republic	1.0	1.0	1.4	0.8	2.5	0.5	< .001
	Poland	1.0	1.0	1.4	0.8	2.5	0.5	< .001
	Slovakia	1.0	1.0	1.1	0.5	3.1	0.4	< .001
PUI2	Czech Republic	1.0	2.0	1.7	0.9	1.6	0.7	< .001
	Poland	2.0	2.0	2.1	1.1	1.1	0.7	< .001
	Slovakia	1.0	1.0	1.3	0.6	2.5	0.5	< .001
PUI3	Czech Republic	1.0	2.0	2.0	1.1	0.9	0.8	< .001
	Poland	1.0	2.0	1.9	1.2	1.3	0.7	< .001
	Slovakia	1.0	1.0	1.3	0.7	2.2	0.5	< .001
PUI4	Czech Republic	1.0	1.0	1.7	1.0	1.5	0.7	< .001
	Poland	1.0	1.0	1.8	1.1	1.5	0.7	< .001
	Slovakia	1.0	1.0	1.3	0.7	2.4	0.5	< .001
PUI5	Czech Republic	1.0	1.0	1.8	1.1	1.2	0.7	< .001
	Poland	1.0	1.0	1.6	1.0	1.8	0.6	< .001
	Slovakia	1.0	1.0	1.4	0.8	2.0	0.6	< .001
PUI6	Czech Republic	1.0	1.0	1.5	0.9	1.8	0.6	< .001
	Poland	1.0	1.0	1.5	0.8	2.1	0.6	< .001
	Slovakia	1.0	1.0	1.4	0.8	2.2	0.5	< .001

A detailed analysis of the distribution of PUI symptoms brings interesting results. Polish and Czech samples are similar in terms of the distribution of responses. Slovak adolescents have a much lower level of PUI than their peers in

the two neighbouring countries. Most adolescents do not exceed thresholds that could be considered worrying. In all countries, it was observed that the two items, namely PUI1 (lack of sleep or meals in favour of Internet use) and PUI 6 (conflicts in the family due to Internet use), are the ones that occur the least frequently. Items numbers 2–5, on the other hand, are those that occur most frequently in the surveyed sample (Table 4).

Table 4. Percentage distribution of PUI-related answers for the Czech Republic, Poland, and Slovakia

		Czech Republic		Poland		Slovakia	
		N	%	N	%	N	%
PUI 1	Never (0)	1142	73.4	371	74.1	410	85.8
	A few times (1)	292	18.8	90	18.0	49	10.3
	At least every Month (2)	53	3.4	12	2.4	14	2.9
	At least every week (3)	38	2.4	14	2.8	5	1.0
	Daily or almost Daily (4)	30	1.9	14	2.8	0	0.0
PUI 2	0	772	49.6	149	29.7	354	74.1
	1	563	36.2	241	48.1	98	20.5
	2	93	6.0	30	6.0	15	3.1
	3	74	4.8	35	7.0	7	1.5
	4	53	3.4	46	9.2	4	0.8
PUI 3	0	598	38.5	217	43.3	352	73.6
	1	528	34.0	184	36.7	84	17.6
	2	202	13.0	28	5.6	24	5.0
	3	141	9.1	32	6.4	15	3.1
	4	86	5.5	40	8.0	3	0.6
PUI 4	0	845	54.3	256	51.1	361	75.5
	1	446	28.7	165	32.9	78	16.3
	2	118	7.6	25	5.0	25	5.2
	3	75	4.8	26	5.2	9	1.9
	4	71	4.6	29	5.8	5	1.0
PUI 5	0	798	51.3	299	59.7	316	66.1
	1	403	25.9	139	27.7	120	25.1
	2	158	10.2	18	3.6	21	4.4
	3	116	7.5	21	4.2	15	3.1
	4	80	5.1	24	4.8	6	1.3

		Czech Republic		Poland		Slovakia	
		N	%	N	%	N	%
PUI 6	0	966	62.1	331	66.1	355	74.3
	1	393	25.3	122	24.4	75	15.7
	2	104	6.7	21	4.2	26	5.4
	3	52	3.3	15	3.0	18	3.8
	4	40	2.6	12	2.4	4	0.8

Based on the one-way analysis of variance, it was observed that the frequency of PUI indicators differs between countries. The Czech Republic and Poland are the most similar to each other. The lowest intensity of all indicators was observed among adolescents from Slovakia. The greatest differences among adolescents for the PUI2 variable were observed – being bothered in the absence of Internet access. Polish adolescents most often reported this experience. In contrast, the smallest differences were observed for PUI6, that is, the occurrence of conflicts in the family environment due to time spent online (Figure 1).

Based on cluster analysis using the k-means method, adolescents were grouped according to the intensity of particular attributes related to PUI. Based on multiple

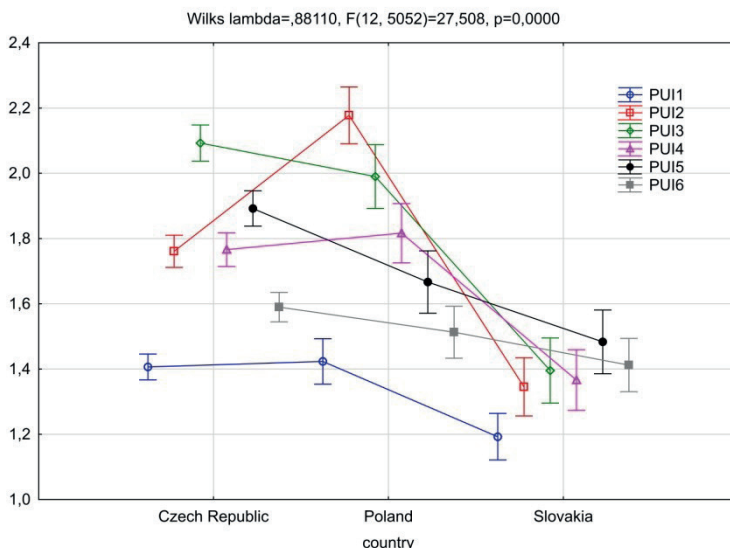


Figure 1. Differences in the intensity of individual PUI items by country

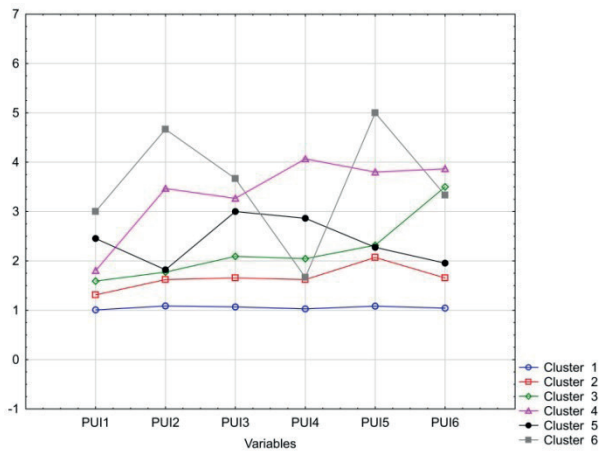
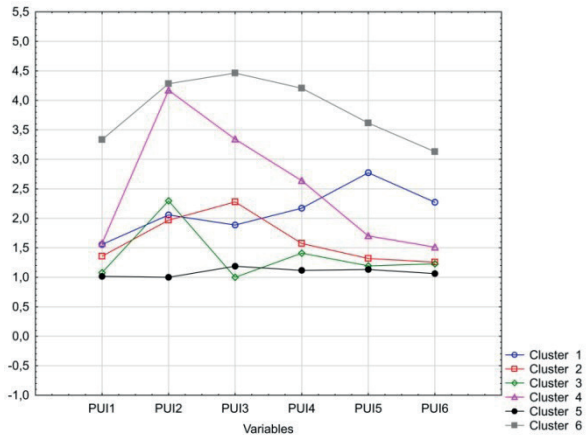
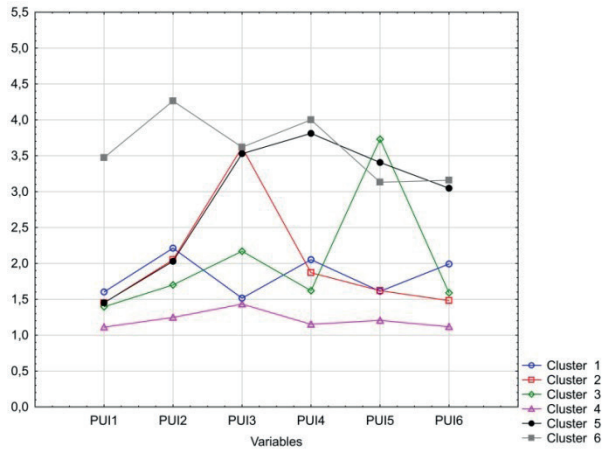


Figure 2. Cluster analysis using the k-means method (order from top to bottom: Czech Republic, Poland, Slovakia)

attempts to visualise the groups in the three countries, it was found that this technique makes it possible to state that the group at risk of PUI (frequent occurrence of all indicators is about 4.88% of adolescents in the Czech Republic, 7.78% in Poland).

In Slovakia, nobody indicated a maximum intensity of 5 or 6 PUI indicators. Among adolescents in Poland, only 0.3% had fully saturated all symptoms of PUI. In the Czech Republic, 0.4% of the adolescents were in the group with a high level of all PUI symptoms. Moreover, the vast majority of adolescents, from 84.0% to 97.5%, do not report any PUI indicators that occur daily or almost daily (Table 5).

Table 5. Distribution of the highest level of PUI indicators

The number of symptoms	Czech Republic	Poland	Slovakia
	%	%	%
0	85.8	84.0	97.5
1	9.3	7.2	1.3
2	2.7	4.6	0.6
3	1.2	1.8	0.4
4	0.6	1.2	0.2
5	0.2	0.8	0.0
6	0.3	0.4	0.0

Using t-test it was noted that the general PUI score is statistically significant for the Czech Republic (t-value=-3.88, $p<0.00$), while statistically insignificant for Poland (t-value=-0.61, $p<0.54$) and Slovakia (t-value=-1.78, $p<0.07$) (Figure 3).

5. Discussion

Our study aimed to explore the phenomenon of problematic internet use in three countries: the Czech Republic, Poland, and Slovakia.

Our study confirmed that a minority of young people experience PUI. When the highest frequency is considered, those who scored five or six symptoms of PUI were 0.5% in the Czech Republic, 1.2% in Poland, and 0% in Slovakia. At the same time, 85.8%, 84%, and 97.5% did not report the highest frequency of any of the symptoms. It is in line with the results of similar comparative international studies, e.g., EU NET ADB (Tsitsika et al., 2014) or the results of other European countries (Smahel et al., 2020). In our sample, the lowest level of PUI was observed in the

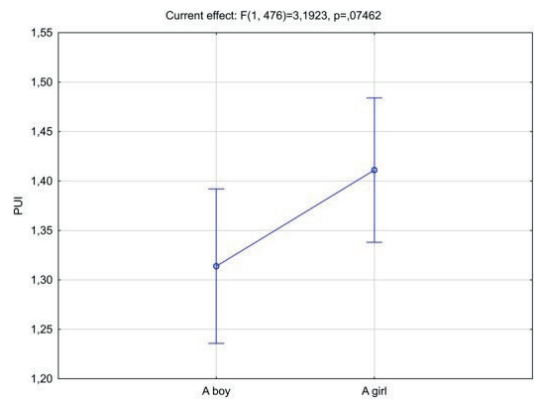
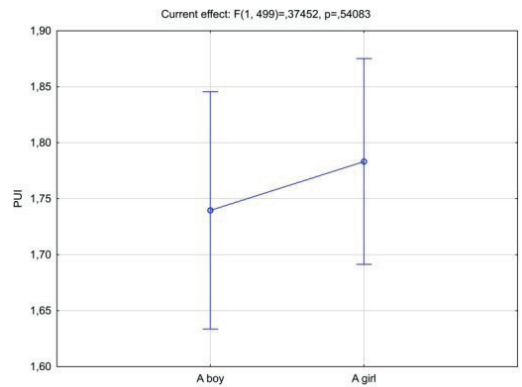
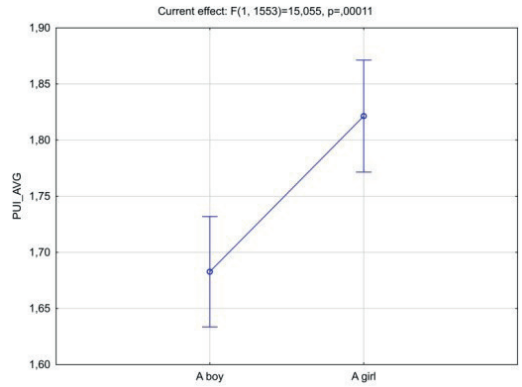


Figure 3. PUJ and gender (order from to to bottom: Czech Republic, Poland, Slovakia)

Slovakia sample, while adolescents in the Czech Republic and Poland presented higher levels of PUI.

Analysis of gender differences has shown a general pattern of higher levels of PUI in girls. It is contrary to the findings in recent meta-analyses showing men and boys as more vulnerable (Baloğlu et al., 2019; Su et al., 2019). However, other studies show no gender differences in PUI levels (e.g., Costa et al., 2019) or higher results in girls (Casaló & Escario, 2019). This relative inconsistency in the findings may be attributed to the different tools used in various studies. Some researchers suggest that girls tend to score higher in specific types of PUI, such as problematic use of social media (Ostendorf et al., 2020). Additionally, other variables, such as psychological features (e.g., loneliness) or family situation (e.g., attachment to parents), may be stronger predictors of PUI than gender and moderate its effects.

In our sample, we have noticed the gradation in the frequency of the measured symptoms observed equally in all three countries. Severe problems, such as insomnia, eating problems related to Internet use, and family conflicts caused by Internet use, were the least prevalent. All other symptoms were more prevalent. They included mood modification (feeling bothered while not online), the need to increase online activities to feel good, withdrawal syndrome and relapse. That again shows that the validity and content of the instrument may significantly impact the results since the absence of items measuring some specific symptoms also translates into the overall prevalence of PUI. In general, this study confirms, as the authors of recent meta-analyses state (Baloğlu et al., 2019) that socio-cultural aspects play a significant role in the levels and patterns of PUI. It suggests that in assessing PUI problems, we cannot rely on extrapolation from one sample to another but rather provide a specific analysis of particular subpopulations

The study also has its limitations. Although the data comes from a comparative study (EU Kids Online), the data collection methodology varied among countries (Smahel et al., 2020; Zlamal et al., 2020). In particular, results from Slovakia are based on the household sample and differ from those of the Czech Republic and Poland, where data was collected in schools. Since PUI questions may be sensitive, those sampling differences may have impacted the results.

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