DE GRUYTER OPEN

10.1515/sjph-2016-0026 Zdrav Var 2016; 55(3): 202-211

Macur M, Király O, Maraz A, Nagygyörgy K, Demetrovics Z. Prevalence of problematic internet use in Slovenia. Zdrav Var 2016; 55(3): 202-211

PREVALENCE OF PROBLEMATIC INTERNET USE IN SLOVENIA

RAZŠIRJENOST PROBLEMATIČNE UPORABE INTERNETA V SLOVENIJI

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Received: Aug 21, 2015
Accepted: Mar 23, 2016

Original scientific article

ABSTRACT

Background. Internet use is an integral part of our everyday activities; however, Internet use may become problematic and harmful in a minority of cases. The majority of reported prevalence rates of problematic Internet use refer to adolescent samples, whereas epidemiological studies on representative adult populations are lacking. This study aimed to reveal the prevalence and characteristics of problematic Internet use in Slovenia.

Methods. Problematic Internet Use Questionnaire (PIUQ) was included in European Health Interview Study (EHIS) on representative Slovenian sample. The frequency of Internet use and problematic Internet use were both assessed.

Results. 59.9% of Slovenian adult population uses the Internet daily, and 3.1% are at risk of becoming problematic Internet users, 11% in the age group from 20 to 24 years. Those being at risk for becoming problematic Internet users are younger (mean age 31.3 vs. 48.3 for non-problematic users), more likely to be males (3.6% of males, whereas 2.6% of females are affected), students (12.0%), unemployed (6.3%) or unable to work (8.7%), single (6.5%), with high education (4.5%). Regression analysis revealed that the strongest predictor of being at risk for problematic Internet use is age (ß=-0.338, p<0.001); followed by high educational level (ß=0.145; p<0.001) and student status (ß=0.136; p<0.001).

Conclusion. 3.1% of Slovenian adult population are at risk of becoming problematic Internet users, whereas 3 out of 20 Slovenian adolescents aged from 18 to 19 years are at risk (14.6%). Prevention programs and treatment for those affected are paramount, especially for the young generation.

Keywords:
Internet addiction, problematic Internet use, assessment, prevalence, epidemiology, behavioural addiction

IZVLEČEK

Namen. *Internet je sestavni del naših življenj, vendar pa lahko ima prekomerna uporaba interneta pri posameznikih neugodne posledice. Zasvojenost z internetom je sodoben fenomen, konceptualno še nedorečen, vse več raziskav pa opozarja na problematično uporabo interneta in njene posledice. Večina tovrstnih študij je bila izvedenih na vzorcu mladih in študentov, medtem ko jih na reprezentativnih vzorcih odraslih - kot je primer te študije - primanjkuje. Namen pričujoče raziskave je bil ugotoviti razširjenost in lastnosti problematične uporabe interneta v Sloveniji.*

Metode. *Vprašalnik o problematični uporabi interneta (ang. Problematic Internet Use Questionnaire) je bil pridružen Anketi o zdravju in zdravstvenem varstvu, izvedeni na reprezentativnem slovenskem vzorcu. Izmerjeni sta bili pogostost uporabe interneta in problematična uporaba interneta.*

Rezultati. *59,9% slovenske odrasle populacije dnevno uporablja internet in 3,1% jih je izpostavljenih tveganju, da postanejo problematični uporabniki interneta, kar 11% jih je v starostni skupini od 20 do 24 let. Tveganju so izpostavljeni predvsem mlajši (njihova povprečna starost je 31,1 let v primerjavi s povprečno starostjo neproblematičnih uporabnikov 48,3 let, ob upoštevanju da je bila starost analizirane populacije med 18 in 95 let); bolj verjetna je med moškimi (3,6% moških v primerjavi z 2,6% žensk, ki so izpostavljene tveganju), študenti (12,0%), brezposelnimi (6,3%) in osebami, nezmožnimi za delo (8,7%), samskimi (6,5%) ter osebami z višjo izobrazbo (4,5%). Regresijska analiza je pokazala, da je najmočnejši pokazatelj tveganja za razvoj problematične uporabe interneta starost (ß=-0,338, p<0,001), sledi ji univerzitetna izobrazba (ß=0,145; p<0,001) in status študenta (ß=0,136; p<0,001).*

Zaključek. *3,1% slovenske odrasle populacije je izpostavljene tveganju, da postanejo problematični uporabniki interneta. Najbolj so izpostavljeni mladi, stari med 18 in 19 let: kar trije od dvajsetih (14,6%). Ključnega pomena je priprava preventivnih programov s posebnim poudarkom na mladih ter nudenje terapije tistim, ki jo potrebujejo.*

Ključne besede:
zasvojenost z internetom, problematična uporaba interneta, razširjenost, epidemiologija, vedenjske zasvojenosti, nekemične zasvojenosti

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1 INTRODUCTION

Compared to 2000, Internet use has more than doubled by 2011 (1). Slovenian data show that in 2011 73% households had access to the Internet and 97% individuals between 16 and 74 years old used the Internet (2). Despite the fact that the use of Internet is an everyday activity for most people, when taken to the extreme, it may cause serious harm to the individual and/or to his or her social environment. Although the consensual definition and criteria of problematic Internet use (PIU) is still lacking, the majority of scholars agree that problematic Internet use is associated with addiction-like symptoms (3). There are several conceptual models of PIU (4), such as the components model by Griffiths (5, 6), the cognitive-behavioural model by Davis (7), the model of Young (8), or the model by Tao and colleagues (9). The components model of Griffiths (6), for example, states that six criteria are essential for a diagnosis of PIU: (i) salience: Internet use becomes the most important activity in the person's life, which dominates their thinking, feelings, and behaviour; (ii) mood modification: using the Internet to get into a better mood; (iii) tolerance: increasing amounts of Internet use are required to achieve the former mood-modifying effects; (iv) withdrawal: withdrawal-like symptoms (e.g., irritability, moodiness, shakes) if Internet use is discontinued or suddenly reduced; (v) conflict: conflicts within the individuals themselves, conflicts with others, and conflicts with other activities (e.g., work, school, hobbies, social life) due to excessive Internet use; and (vi) relapse: restarting the activity with the same intensity after a period of abstinence or control. Furthermore, similar to the various conceptual models, different terms are used to address the problematic behaviour, such as Internet addiction (6, 8, 9), pathological Internet use (7), or problematic Internet use (3). We prefer the latter term because it describes both the quintessence of the phenomenon (i.e., not only is the behaviour excessive, but problems related to Internet use are also expected to be present), while avoiding the notion of dependency, addiction, or disorder until a specific definition and diagnostic criteria is clarified and agreed upon.

Problematic Internet use is a heterogeneous concept. According to Griffiths (10),we have to differentiate between dependence on the Internet, and dependence to the Internet. He argues that the majority of individuals presenting with PIU are simply using it as a medium to fuel other addictive behaviours, such as cybersex addiction. In line with the current debate in the field, Internet Gaming Disorder is now included in the appendix of the DSM-5 (11) as a condition that requires further empirical and clinical research. Other excessive online activities, not involving playing online games (e.g., excessive use of social media, such as Facebook; viewing pornography online), were not included in the appendix due to the lack of sufficient research in this area.

Despite heterogeneity, PIU is clearly associated with indicators of psychosocial problems, such as loneliness (12, 13), low well-being (14), low self-esteem (15) and social maladaptation (13). Furthermore, PIU is frequently co-morbid with other mental health issues, such as alcohol and substance use, depression, social phobia and phobic anxiety, schizophrenia, obsessive-compulsive disorder, psychoticism, and even suicidal ideation (16).

There were several studies conducted in Slovenia on Internet addiction. For example, in 2001, Jeriček adapted Young's questionnaire (i.e., Internet Addiction Test) on a sample of 3rd year high school students in Ljubljana (N=1194). Based on the 14 items, high school students display only a few symptoms of PIU: 3.7% of the sample scored 4 or 5 on more than half of items, which was the criteria for problematic use. There were significant differences among different types of schools, time and place of Internet use. Furthermore, gender and school performance were equally important predictors of problematic use (17). In 2004, Šimek conducted a research on PIU among high school students in Maribor (N=622), using Young's instrument. In this study "only" 1.8% were classified as problematic users (18). In another study using a qualitative (interview-based) approach, Internet users reported mild signs of PIU only in certain segments of use (19). Recently, Primožič focused on mental instability in relation to PIU (online study, N=381) and found that mental instability explains only minor part of PIU. Individuals with strong preference for online social interactions were more prone to develop PIU than those with milder preference (20).

Similar to Slovenian studies, most other studies on PIU target mainly adolescent and student samples as well, including nationally representative epidemiological studies (16, 24). However, in contrast to the abundance of epidemiological studies in adolescent populations, to our knowledge, there are very few adult representative studies to estimate the prevalence of PIU to date, probably because of the challenges regarding the diagnostic criteria and the heterogeneous nature of the disorder. In Norway, the prevalence of PIU was 0.7% (21), whereas in the USA, the prevalence was estimated to be around 1% (22), according to two studies published in 2009 and 2006, respectively. The same prevalence rate (1%) was reported in Germany in a general population sample (23) in a study published in 2014. Although there are numerous studies reporting the epidemiology of PIU in adolescent and student samples across the world (16, 24), to our knowledge, no other studies have investigated the prevalence of problematic Internet use among adults in national representative samples before. For this reason, the aim of the current study was to estimate the extent of problematic Internet use among Slovenian adult population.

2 METHODS

2.1 Sample and Procedure

The sample was selected from the Central Registry of Slovenia by Statistical office. The target population were all Slovenian residents, aged 15 years or older, on the day (13 August 2014) residing in private households. Stratified sampling was applied to gather data in statistical regions (NUTS3 level – 12 regions in Slovenia) and type of settlement (6 strata; according to the type (rural/urban) and size of the settlement). One thousand one hundred primary sampling units were selected in the first stage with probability proportional to the size. In the second stage, 10 persons were selected in each sampling unit, resulting in 11,000 persons. These individuals were invited to complete the survey on the Internet. The ones who did not complete it online, but expressed their interest in participating, were invited to complete the questionnaire with the help of a trained interviewer. Mixed interview method proved to be the added value of the current study, given that participants had the choice to choose a more convenient way of responding, in addition to reducing the effect of social desirability. In addition, Internet survey reached younger population that is less likely to respond via personal interviews. As a result, we believe that more participants agreed to participate, given the flexible approach as opposed to using a single technique. In the end, 47.6% of participants responded online and 52.4% via personal interviews.

Questionnaires were administered between 25 August 2014 and 30 November 2014, via CAPI (Computer assisted personal interviewing) or CAWI (Computer assisted web interviewing). Following data collection, data was filtered based on the screening test. We calculated the percentage of nonresponse and validated open-ended questions. Non-participation was statistically controlled by weighting. Survey weights were obtained via automatic iterative weighting ('raking') procedure (custom-made code in R), using population margin for sex, age groups, NUTS-3 regions, the highest level of completed education and degree of urbanization.

The final data set consisted of 6282 individuals who were at least 15 years old, but the current study focused on those participants who were minimum 18 years of age (N=6029). The sample reflected the structure of Slovenian adult population: 49.0% of males and 51.0% of females. Out of the total sample, 48.7% were employed or self-employed, 31.4% of the sample represented retired people, 6.7% of the sample were students and one tenth of the sample were unemployed. The majority had secondary education[1]; the mean age was 49.2 years (age range 18 to 95, SD=17.9) (see Table 1).

Table 1. The sample (N=6029) structure.

SAMPLE STRUCTURE	N	%
Gender		
male	2956	49.0%
female	3073	51.0%
Marital status		
single	1877	31.8%
married or living together	3147	53.3%
widow	556	9.4%
divorced	326	5.5%
Primary occupation		
employed	2635	44.5%
self-employed	252	4.2%
unemployed	623	10.5%
student	396	6.7%
retired	1861	31.4%
unable to work	56	0.9%
housewife	101	1.7%
Education		
primary school or less	1448	24.2%
secondary school	3241	54.3%
university degree or more	1283	21.5%
Age	Mean	(std.dev.)
male	47.7	(17.0)
female	50.6	(18.7)

2.2 Measures

Basic socio-demographic variables, such as gender, age, marital status, occupational status and education, were collected in European Health Interview Survey along with the frequency of Internet use and problematic Internet usage. Problematic Internet use was assessed using the Problematic Internet Use Questionnaire Short-Form (PIUQ-SF-6) (25). This instrument derives from the 18-item Problematic Internet Use Questionnaire, which assesses three dimensions of the problem behaviour: obsession, neglect, and control disorder (26). The shorter version followed the original three-factor structure, each measured by two items (see Figure 1 for this instrument). The initial structure was tested with confirmatory factor analysis, which indicated acceptable fit to the data (χ^2=212.4, df=6, p<0.001; CFI=0.983; TLI=0.957;

[1] Education was measured by 12 levels; secondary school was represented by 3 categories: 3-year vocational training, 4-years vocational training, and gymnasium.

RMSEA=0.083 [0.074-0.093]). Participants used a 5-point Likert scale (from "never" to "always/almost always") to estimate how much the given statement characterized them. Scores ranged from 6 to 30, with higher scores indicating increased problematic Internet use. Latent profile analysis (LPA) was used with the six PIUQ-SF items as input variables to determine latent groups. LPA resulted in two groups, one with average score on the six PIUQ-SF items and another one with relatively high values. This second group was considered to be at risk of problematic Internet use. Taking this group as the gold standard, we analysed the sensitivity, specificity, positive and negative predictive value and diagnostic accuracy of each cut-off score, and chose the one with the best indicators, which was the score of 15. Both instruments showed good psychometric properties (25-27). Internal consistency (Cronbach alpha) of the 6-item PIUQ was 0.8 in the present sample.

In our research, only respondents who frequently use the Internet were offered the PIUQ-6 set of questions. The screening question was: "How often did you use the Internet in the last 3 months on average?" It was scored as 1=every day or almost every day; 2=at least once a week; 3=less than once a week. Answers 2 and 3 were interpreted as non-problematic Internet users and only the rest of the sample received PIUQ-6 set of questions. Answers were summed up[2] and those who scored 15 or more were considered problematic Internet users. Those having one or more missing values on PIUQ-6 scale were not included in the calculation of problematic Internet use. For all analyses, bivariate statistical methods (chi-square test and t-test for two independent samples) and multivariate regression analysis were used to calculate group differences and effect.

3 RESULTS

3.1 The Frequency of Internet Use

Given that the concept of problematic Internet use encompasses frequent use of the Internet, PIUQ-6 questions were only administered to those participants who reported using the Internet every day or almost every day (59.9%). Table 2 shows that over one tenth of the adult sample (11.7%) reported using the Internet at least once a week, but not every day, whereas 28.5% uses the Internet less than once a week. Both categories were identified as non-problematic Internet users.

Table 2. The frequency of Internet use.

	n	%
Every day or almost every day	3247	59.9%
At least once a week (but not every day)	633	11.7%
Less than once a week	1545	28.5%
Total	5425	100%

The data revealed that the frequency of Internet use is associated with age ($F=1770.8$[3]; $p<0.001$). The mean age of daily Internet users is 39.6 years (SD=13.47); whereas the mean age of the ones who use the Internet at least once a week is 48.3 years (SD=13.06); and the mean age of those who use the Internet less than once a week is 64.3 years (SD=13.61). Table 3 provides further details. Frequent Internet use relates strongly to an employment status: 96.6% of students, 83.9% of self-employed, 73.8% of employed, and 66.3% of unemployed use the Internet every day or almost every day. On the other hand two thirds (67.5%) of retired people use the Internet less than once a week. Unmarried individuals use the Internet more frequently than those who are married. High educational level is associated with frequent Internet use as well.

3.2 Problematic Internet Use

PIUQ-6 questions revealed various problems with Internet use (see Figure 1). Over one-tenth of participants reported to spend time online instead of sleeping (7.7% sometimes, 3.7% often, 0.8% always/almost always); and about the same proportion failed in their attempt to decrease the amount of time spent online (7.1% sometimes, 3.3% often, 0.8% always/almost always). About 6% reported that others complained about them spending too much time online (4.4% sometimes, 1.2% often, and 0.3% always/almost always).

[2] Scoring: 1=never; 2=rarely; 3=sometimes; 4=often; 5=always/almost always.

[3] One – way ANOVA test

Table 3. The frequency of Internet use according to socio-demographic variables.

	How often did you use the Internet in the last 3 months on average?						Total	χ^2 (sig. χ^2)
	Every day or almost every day		At least once a week (but not every day)		Less than once a week			
	n	%	n	%	n	%	N	
Gender								
Male	1690	63.1%	335	12.5%	653	24.4%	2678	43.750
Female	1558	56.7%	297	10.8%	892	32.5%	2747	(p<0.001)
Formal marital status								
Single, has never been married	1412	79.5%	152	8.6%	212	11.9%	1776	908.125
Married (or has a registered homosexual partnership)	1556	54.5%	403	14.1%	897	31.4%	2856	(p<0.001)
Widow, not married again	50	12.1%	26	6.3%	336	81.6%	412	
Divorced, not married again	163	55.6%	38	13.0%	92	31.4%	293	
Employment status								
Employed	1856	73.8%	354	14.1%	306	12.2%	2516	1.850.238
Self-employed	208	83.9%	22	8.9%	18	7.3%	248	(p<0.001)
Unemployed	380	66.3%	70	12.2%	123	21.5%	573	
Student	373	96.6%	13	3.4%	0	0.0%	386	
Retired	335	22.3%	154	10.2%	1016	67.5%	1505	
Unable to work	19	40.4%	7	14.9%	21	44.7%	47	
Housewife	27	31.4%	2	2.0%	57	66.3%	86	
Educational level								
Primary school or less	268	23.3%	103	9.0%	779	67.7%	1150	1.379.089
Secondary school	1864	62.1%	442	14.7%	697	23.2%	3003	(p<0.001)
University degree or higher	1107	88.3%	83	6.6%	64	5.1%	1254	

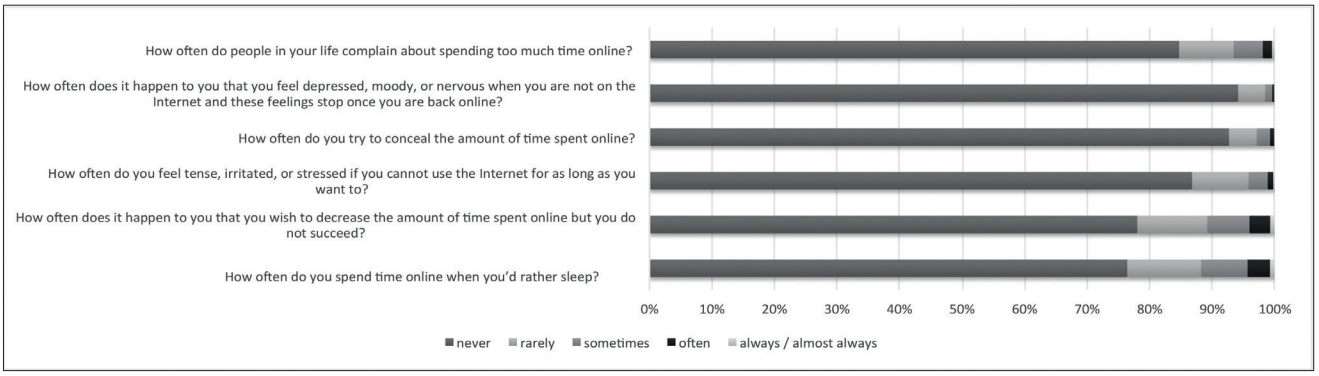

Figure 1. PIUQ-6 items in Slovenian representative sample[4].

[4] Those who used the Internet less than daily were not offered PIUQ-6 and were considered as non- problematic users. They were added to the answer »never«. Missing values were excluded from calculation.

Individuals were classified as being at risk of problematic Internet use with a score of 15 or more on the PIUQ-6. As it appears in Table 4, 3.1% of the sample, thus of the Slovenian adult population, can be considered to be at risk of problematic Internet use.

Table 4. The prevalence of problematic Internet use.

	n	%
Non-problematic	5187	96.9%
Being at risk of problematic use	165	3.1%
Total	5352	100.0%

Given that Internet use is related to age (χ^2=227.472; p<0.001), we present problematic Internet use separately in each age group. According to Figure 2, 14.6% of those aged 18 and 19, 11% of those between 20 and 24 years old and 8.6% of those between 25 and 29 years old are at risk of becoming problematic Internet users. In the age group 30-34, the percentage of those at risk is significantly lower, only 3.5%, whereas it is close to 0% after 65.

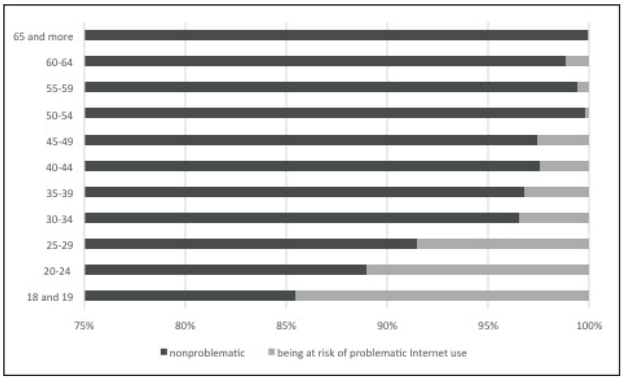

Figure 2. Problematic internet use in different age groups.

Table 5 reveals that being at risk of problematic Internet use is weakly related to gender (χ^2=4.72; p=0.030) and to educational level (χ^2=22.56; p<0.001). There is a stronger connection to marital (χ^2=105.38; p<0.001) and employment status of the respondents (χ^2=168.64; p<0.001).

Those at risk of problematic Internet use are more likely to be male (3.6%), single (6.5%) and have higher educational level than non-problematic users. Among different groups, the highest rate of those at risk of problematic Internet use can be found among students (12.0%), followed by those who are unable to work due to disability, illness or age (8.7%), and those unemployed (6.3%). Individuals unable to work comprise a heterogeneous group; age ranges from 19 to 64 years, with a mean age of 45.5 (SD: 11.06), they are mostly male (72.5%) and single (52.8%). These results indicate that problematic Internet use is highly dependent on age, given its high prevalence among students and those unmarried. The mean age of those at risk of problematic Internet use is 31.29 years (SD=11.7, min. 18 years, max. 84 years), whereas the mean age of non-problematic Internet users is 48.25 years (SD=17.2, min. 18 years, max. 95 years) (t=18.082; p<0.001).

Possible predictors of problematic Internet use were tested with multiple linear regression analysis, where the dependent variable (being at risk of problematic Internet use) was entered as continuous variable calculated from the 6 variables presented on Figure 1. Predictors used in the model were: male gender, the age of the respondent (as numeric variable), living with a partner[5], university degree or more, student status, and unemployment. Results indicated that the model explained 22.8% of the variance of problematic Internet use (R^2=0.228; F(2)=223.37, p<0.001). The stronger predictor of being at risk of problematic Internet use is age (ß=-0.338, p<0.001); followed by high educational level (ß=0.145; p<0.001) and student status (ß=0.136; p<0.001). Thus PIU is more prevalent in the younger generation, non-existent in the older generation and has low prevalence among those who live with their partners.

[5] "Do you live with your partner?" Measured as 1="yes, I am married" or "yes, I live with my partner", and 0="no".

Table 5. The prevalence of problematic Internet users according to gender, educational level, marital and employment status.

	Problematic internet use								Total	χ^2 (sig. χ^2)
	non-problematic				being at risk of problematic use					
	n	%	95% CI		n	%	95% CI		N	
Total	5187	96.9%	96.4%	97.3%	165	3.1%	2.7%	3.6%	5352	
Gender										
Male	2541	96.4%	95.6%	97.0%	95	3.6%	3.0%	4.4%	2636	4.719
Female	2646	97.4%	96.8%	98.0%	70	2.6%	2.0%	3.2%	2716	(0.030)
Educational level										
Primary school or less	1130	98.9%	98.1%	99.3%	13	1.1%	0.7%	1.9%	1143	22.558
Secondary school	2860	96.7%	96.0%	97.3%	97	3.3%	2.7%	4.0%	2957	(p<0.001)
University deg. or more	1180	95.5%	94.2%	96.6%	55	4.5%	3.4%	5.8%	1235	
Current formal marital status										
Single, Have never been married	1638	93.5%	92.2%	94.6%	114	6.5%	5.4%	7.8%	1752	105.381
Married (also registered homos. par.)	2770	98.4%	97.8%	98.8%	46	1.6%	1.2%	2.2%	2816	(p<0.001)
Widow(er), not married again	411	100.0%	99.1%	100.0%	0	0.0%	0.0%	0.9%	411	
Divorced, not married again	288	99.0%	97.0%	99.6%	3	1.0%	0.4%	3.0%	291	
Employment status										
Employed	2422	97.6%	96.9%	98.1%	60	2.4%	1.9%	3.1%	2482	168.639
Self-employed	233	96.3%	93.1%	98.0%	9	3.7%	2.0%	6.9%	242	(p<0.001)
Unemployed	531	93.7%	91.3%	95.4%	36	6.3%	4.6%	8.7%	567	
Student	329	88.0%	84.3%	90.9%	45	12.0%	9.1%	15.7%	374	
Retired	1492	99.6%	99.1%	99.8%	6	0.4%	0.2%	0.9%	1498	
Unable to work	42	91.3%	79.7%	96.6%	4	8.7%	3.4%	20.3%	46	
Housewife	84	98.8%	93.6%	99.8%	1	1.2%	0.2%	6.4%	85	

Note: *Wilson Score Interval is used because of the small percentage of those at risk of problematic Internet use.

Table 6. Multiple regression analysis for problematic Internet use.

Model	Coefficients[a]	Unstandardised Coefficients		Standardised Coefficients	t	*p*
		B	Std. Error	ß		
1	(Constant)	9.54	0.16		58.58	<0.001
	Male gender (0,1)	0.27	0.08	0.05	3.41	0.001
	Age	-0.06	0.003	-0.34	-22.02	<0.001
	Living with partner (0,1)	-0.25	0.10	-0.04	-2.58	0.010
	University degree or higher (0,1)	1.13	0.11	0.15	10.77	<0.001
	Student status (0,1)	1.52	0.17	0.14	8.69	<0.001
	Unemployed (0,1)	0.27	0.13	0.03	2.12	0.034

Note: Dependent Variable: Problematic Internet use

4 DISCUSSION

The present study aimed to explore the extent of problematic Internet use in Slovenian adult population. We found that three out of five people (59.9%) use the Internet daily or almost every day. Males, those who are single, students, and those with a university degree are more likely to use the Internet on a daily basis compared to other groups. According to the Problematic Internet Use Questionnaire Short-Form, 3.1% of the sample representing Slovenian adult population are at risk of problematic Internet use. 3.6% of the male population are at risk of problematic use, whereas this proportion is slightly lower for females (2.6%). The mean age of those at risk of problematic use is substantially lower than the mean age of non-problematic users (31.29 years [SD=11.7], and 48.25 years [SD=17.2], respectively). Education level appears to be weakly related to problematic Internet use; those with a higher educational level are more at risk. Among those who are single, the proportion of those at risk of problematic Internet use is much higher (5.4%) than among those who are married (1.2%). Additionally, the proportion of those at risk of problematic Internet use is the highest among students (12.0%), followed by those unable to work (8.7%) and unemployed at the time of data collection (6.3%). Out of all dimensions used to assess problematic Internet use, the most prevalent problem dimension is the 'control' dimension, which is related to the difficulties in controlling one's Internet use. The two items belonging to this factor are: "How often does it happen to you that you wish to decrease the amount of time spent online but you do not succeed?" and "How often do you spend time online when you'd rather sleep?".

These finding are in line with previous findings in the literature. Problematic Internet use appears to be more common among young and unmarried individuals as well as among males (28). A review of previous studies also found higher prevalence of problematic use among males compared to females (16, 24); however, the majority of the studies included in these reviews focused on adolescent rather than adult samples. Interestingly, we found differences in educational levels in terms of Internet use frequency; problematic use of the Internet increases with higher educational level.

Large representative samples are necessary to estimate the prevalence of any phenomena in the general population (29). However, the majority of recent studies reporting prevalence rates in nationally representative samples studied adolescent samples (24). The reported prevalence rates in these studies ranged from 1% in Germany (23) to 18.7% in Taiwan (30). Unfortunately, epidemiological studies exploring problematic Internet use in representative adult populations are lacking in the field (16). A representative survey of German population aged between 14 and 94 years reported 3.5% of Internet users had two or more negative consequences as a result of Internet use (28). Similarly, a survey investigating Hungarian general adult population found that 11% of those who use the Internet regularly (weekly or more often) could be characterised as being at risk of problematic use, which translates to approximately 4.2% of the general population (27). These results are comparable to the findings of the present study, although the studies mentioned earlier (21-23) report considerably lower prevalence rates (i.e., 0.7% and 1%).It is hard to compare the results obtained with different measurement tools; we also assume problematic Internet use nowadays is higher than 5 or 10 years ago, when these studies were made.

The study is not without its limitations. We used a mixed method of interviewing (on-line and personal interview), which may have influenced the findings. However, we believe that a mixed method of interviewing is an added value of the survey, rather than a limitation. By this method, participants had the choice to select the most suitable way of participation, thus increasing the probability of taking part in research. Furthermore, this method reduced social desirability bias as well. Internet survey reached younger population that is less likely to be reached by personal interviews. The self-reported nature of the data is prone to biases, such as memory recall bias. Because of the cross-sectional design of the study, causal relationships between variables cannot be reliably assessed. Furthermore, there exists a risk of over-pathologising Internet use (31). Screening tests alone are unsuitable to establish a valid diagnosis, due to the high rate of false positive cases (32). In the case of disorders with low prevalence rates, screening instruments with sensitivity and specificity around 80% have positive predictive values between 10 and 20%, meaning that only one or two out of ten who screen positive are truly problematic users (32). Therefore, it is important to treat the reported prevalence rates with caution when estimating the scale of the problem. Future studies should assess online activities separately to uncover the nature of problematic Internet use, such as gaming, social networking or using the Internet for work purposes.

5 CONCLUSION

Overall, 3.1% of the Slovenian adults are estimated to be at risk of problematic Internet use. The Internet is an integral part of everyday life, especially for the younger generation. According to our findings, problems related to Internet use are more common among those who are in their twenties or early thirties: 14.6% of 18-19 year-

olds, 11% of 20-24 year-olds and 8.6% of 25-29 year-olds are at risk. The percentage of problematic Internet users is significantly lower (3.5%) in the age group from 30 to 34 years, whereas it is close to 0% after 65 years of age. It is paramount, therefore, to provide psychoeducation and other preventive programmes for young adults to reduce or prevent the development of physical and psychological problems, such as loneliness, low self-esteem and social maladaptation.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

FUNDING

The research was financed by the Ministry of Health of the Republic of Slovenia.

ACKNOWLEDGEMENT

Present work was supported by the Hungarian Scientific Research Fund (Grant number: 111938).

ETHICAL APPROVAL

All the data analysed in this study were collected at the National Institute of Public Health in the study European Health Interview Survey (EHIS) that is conducted according to the strict methodological guidelines by Eurostat.

The study was conducted in accordance with the code of Ethics of the World Medical Association (Declaration of Helsinki).

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