

Prevalence And Risk Factors Of Internet Addiction Among Hungarian High School Teachers

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Abstract

The extensive availability of internet has led to the the recognition of problematic internet use (so called internet addiction, IA) mostly involving adolescents. There is insufficient data about the prevalence of IA in adults.

Here we present a study focusing on the prevalence and risk factors of internet addiction among high school teachers.

Overall 2500 paper-based questionnaires were successfully delivered and 1817 responses received (response rate of 72.7%). 1194 females (65.7%) and 623 males (34.3%) participated in our study.

In a multivariate analysis including of all factors (demographic data, internet habits, comorbidity etc) age < 35 years (OR: 6.098, CI: 5.09-7.08, $p < 0.001$), male gender (OR=5.413, CI: 4.39-6.18, $p = 0.002$), surfing on the internet > 5 hours daily (OR 2.568, CI: 2.03-3.39, $p < 0.001$), having no children (OR: 1.353, CI: 1.13-1.99, $p = 0.0248$), and having secondary employment (OR=11.377, CI: 8.67-13.07, $p = 0.001$) were significantly associated with internet addiction.

This is the first study from Hungary showing the prevalence and risk factors of internet addiction among high school teachers. A small, but significant proportion suffered from IA. Our study also draws attention to the risk factors of IA such as younger age, family status and working type.

Introduction

The widespread use of internet has dramatically changed our lives by the 21st century. Although this technological revolution has improved many aspects of our lives and it is now essential part of the everyday routine, including work, private life and social functioning, many studies reported the misuse of internet (problematic internet use, internet addiction; IA) as summarized in a recent meta-analysis (1). The individual suffering from internet addiction may be not aware of it and the symptoms remain unrecognized by his or her relatives, friends and colleagues (2).

IA may be classified as a compulsive-impulsive spectrum disorder based on symptomatology, but it has been under considerable research, and is not included in the recently published 5th edition of the Diagnostic and Statistical Manual DSM-V (3,4).

IA seems to have several risk factors such as younger age at the start of internet use, male gender, daily time interval, goal of internet use and low socioeconomic status (3,5). Psychosocial factors such as low self-concept and and lack of family support are also associated with problematic internet use (6,7). Problematic internet use seems to be associated with medical conditions such as anxiety, depression, drug abuse and malnutrition (8,9).

IA is mainly studied in adolescents (who may be at heightened risk for mental health problems), and there is insufficient data about about its prevalence among adults including (their) teachers (10).

The aim of our research was to detect the prevalence of internet addiction among high school teachers and its risk factors including age, gender, family type, working years, daily internet use and the goal of being online. Medical conditions may be associated with IA such as smoking, alcohol and drug intake, hypertension, diabetes, ischemic heart disease, musculoskeletal pain and history of depression were also recorded.

Materials And Methods

This prospective, cross-sectional, paper-based questionnaire study was conducted between January 2020 and August 2020 in 14 sites in Hungary. The names of the included schools are mentioned in the Acknowledgement part.

The study was approved by the Ethical Committee of the University of Pecs (8434-PTE 2020). Consent was obtained from the individuals prior to data collection. Paper-based questionnaires were delivered to those who had previously agreed to participate by signing an informed consent.

Inclusion criteria were working as a high school teacher, being between 18 and 65 years of age and being employed at the time of the study apart from the type of employment (public servant, sub-contractor etc).

Excursion criteria were being under 18 or over 65 years of age, being on permanent leave or refusing to participate in the study.

Demographic criteria included age, gender, marital status, number of children, type of work, years spent with work, work schedule, legal relation, secondary employment.

Included risk factors and medical conditions were smoking, alcohol and illicit drug intake; diabetes, hypertension, ischemic heart disease, musculoskeletal pain, and history of depression.

Internet addiction was detected with the Problematic Internet Use Questionnaire, which is a validated self-report scale with good reliability and validity characteristics (11). The questionnaire contains 18 items, each scored on a 5-point Likert-type scale ranging from 1 [never] to 5 [always]. A confirmatory factor analysis verified the three factor model of questionnaire, each subscale contains six items. A total score exceeding 41 points suggests Internet addiction (12).

Data were evaluated as means \pm SD [standard deviation] by Student's t-test, the chi square test and the Spearman's Rank-Order Correlation. Logistic regression analysis was used to determine the significance of the different parameters as independent risk factors of IA. The analysis was performed with appropriate adjustments for differences in risk factors and medication usage. For all odds ratios, an exact CI of 95% was constructed in our study.

Results

Baseline characteristics

Overall 2500 paper-based questionnaires were successfully delivered and 1817 responses received (response rate of 72.7%).

1194 females (65.7%) and 623 males (34.3%) participated in our study. Age distribution was the following: 18-25 years 2.5% (46/1817), 26-35 years 11.9% (217/1817), 36-45 years 31.8% (577/1817), 46-55 years 33.1% (602/1817), 56-62 years 15.7% (285/1817) and 5.0% above 62 (90/1817) (Table 1)

73.6% (1339/1817) were married or lived in a relationship, 26.4% (478/1817) were single. 23.1% (419/1817) had no children, 22.8% (414/1817) had one child, 38.9% (706/1817) had two and 15.2% (278/1817) had three or more children.

0.5% (9/1817) had elementary degree, 5.8% (105/1817) had secondary education and 93.7% (1703/1817) had university graduation.

2.9% (54/1817) have been employed for less than a year. 37.0% (671/1817) of the study population have been working between 21-40 years, 32.1% (584/1817) have been working between 11-20 years and 2.2% (40/1817) more than 40 years. 12.8% (233/1817) had also a secondary employment (Table 1).

Risk factors and previous diseases

15.1% (275/1817) were regular smokers, 5.1% (93/1817) were taking alcohol and 2.9% (52/1817) were taking illicit drugs more or less regularly.

22.8% (414/1817) had hypertension, 7.4% (135/1817) were diabetic, 10.2% had ischemic heart disease (186/1817), 8.0% (146/1817) suffered from musculoskeletal pain, and 1.5% (27/1817) had a history of depression (Table 2).

Duration and goal of internet use

38.3% (696/1817) spent less than one hour online and 2.0% (35/1817) used the internet more than six hours a day. More than half of the examined workers preferred being online between 6-9 pm (51.9%, 943/1817). The main goals of internet surfing were to every day work 93.0% (1689/1817), visit community portals 42.5% (773/1817) and listening to music in 30.0% (539/1817). Detailed data can be seen in Table 2.

Internet addiction

Internet addiction was detected in 5.2% (95/1817) based on the Problematic Internet Use Questionnaire. Internet addiction was more common in males (62.1 vs 32.7%, $p=0.001$) and workers below 35 years of age (29.5 vs. 13.6%, $p < 0.001$). Being middle-aged or older was protective against IA (54.8 vs. 34.7%, $p=0.001$, mostly driven by aged between 45-55)

IA was more prevalent among singles (23.1 vs 14%, $p=0.011$), and childless (34.7 vs 22.4%, $p=0.004$) (Table 3). Living in a relationship (74.2 vs 63.1%, $p=0.018$, mostly driven by being married) or having at

least two children (55 vs 40%, $p=0.004$, mostly driven by having two children) were protective against IA.

Lower educational level was also associated with IA (3.2 vs 0.3%, $p<0.001$).

Working for less than a year was a predictor of IA (7.3 vs 2.7%, $p=0.009$), while working for > 20 years was protective (40.1 vs 21.1%, $p<0.001$) (Table 3). Having a secondary employment was significantly associated with problematic internet use (85.3 vs 12.7%, $p<0.001$)

There was a significant association between the duration of being online and being addicted to internet ($r=0.36$, $p<0.001$) (Table 4). The cut-off of spending 5 hours or more online predicted IA. We have found no association between daily time interval of internet use and IA.

Among the types of internet services internet gaming (25.2 vs 7.8%), chatting (40 vs 21.6%) and matchmaking (11.6 vs 2.4%, $p<0.001$ in all cases) were significantly associated with IA (Table 4).

Internet addiction was more prevalent among smokers (34.7 vs 14.1%), alcohol and drug users (17.9% vs. 4.4%, 15.8% vs 2.1%, $p<0.001$ in all cases). Diabetes (13.7 vs 7.1%, $p=0.016$) and history of depression (8.4 vs 1.1%, $p<0.001$) were significantly associated with problematic internet use (Table 4).

In a multivariate analysis including of all factors (demographic data, internet habits, comorbidity etc) age < 35 years (OR: 6.098, CI: 5.09-7.08, $p<0.001$), male gender (OR=5.413, CI: 4.39-6.18, $p=0.002$), surfing on the internet > 5 hours daily (OR 2.568, CI: 2.03-3.39, $p<0.001$), having no children (OR: 1.353, CI: 1.13-1.99, $p=0.0248$), and having secondary employment (OR=11.377, CI: 8.67-13.07, $p=0.001$) were significantly associated with internet addiction.

Discussion

Internet addiction is a well known phenomena among adolescents, but only few studies focused on its prevalence among adults, and we have found only one study including (their) teachers (10).

In a recent meta analysis the rate of internet addiction was 7.2% in the general population, which is far lower than it would be expected by the IA rate of adolescents which can be as high as 20% (13,14). In our study the rate of IA was 5.2%, which is comparable to the above mentioned findings. IA has been under considerable research, and has generated controversy, debate and quarreling among expert researchers, healthcare and non-healthcare professionals due to insufficient data, poor quality research and the lack of randomized studies, but based on our and the above mentioned results it is more than a phenomena of adolescents who may be at heightened risk for mental health problems.

Internet addiction was more common in males in our study and confirmed the hypothesis of gender-related differences in this addictive behavior (15). Internet addiction was also more prevalent in entrants up to the age of 35 underlying the importance of lower age of first internet use (16,17). Our study also confirmed the protective role of increasing age. In a multivariate analysis younger age and male gender remained significant predictors of IA.

Singles, childless ones are at higher risk of IA based on our study. The protective role of living in a relationship and having children (as well as increasing age) was also reported by a previous study (18). Having no children remained a significant predictor of IA in a multivariate analysis.

Problematic internet use was associated with chatting, gaming and watching movies taking the types of internet use into account. This is in concordance with recent results showing different distribution patterns of IA based on sex and specific internet services, chatting, gaming and watching movies (mostly pornography) were strongly associated with this phenomena (19). However, the goal of internet use lost its predictive value in a multivariate analysis.

Increased frequency of internet use has been previously shown being associated with IA, several studies showed 2 hours cut-off time interval as the predecessor of addiction (20,21). We found the cut-off value of 5 hours or more daily internet use as an independent risk factor of IA, which is in concordance with very recent results (22). Moreover, several time intervals such as nighttime internet use may precede IA in adolescents based on recent results, but our study could not confirm it among teachers (22).

IA was also associated with substance abuse such as alcohol or drugs and history of depression. The association of IA and psychiatric symptoms is not well understood. An underlying psychopathology (history of addiction) may precipitate internet addiction or IA may lead to the onset of consequent behavioural abnormalities and mood disorders, and finally they may enhance each other (23). Drug addicts who use stimulants may have specific vulnerability to IA based on a recent study (24).

Diabetes was also significantly associated with internet addiction. Based on a recent meta-analysis each additional 1 h/d of internet use was associated with 8% increased odds of overweight and obesity, which can lead to metabolic syndrome, diabetes and cardiovascular morbidity (25). However, a multivariate analysis could not confirm the predictive roles of substance abuse, depression and diabetes as risk factors of IA.

Secondary employment was also associated with IA and also remained a significant predictor in a multivariate analysis. Being overwhelmed with work can lead to distress and social anxiety, which seem to be predecessors of problematic internet use (26). Furthermore, overwork can be the predictor of burnout and a recent study showed the possible association of burnout and internet addiction in adolescents (27).

In summary, this is the first study from Hungary showing the prevalence and risk factors of internet addiction among high school teachers. A small, but significant proportion suffered from IA. Our study also draws attention to the risk factors of IA such as younger age, family status and working type.

Finally, our article has some limitations. Although it was a prospective study in nature including more than 1700 teachers, it was not representative of internet addiction in the general/adult population. As it was a questionnaire based survey, physical examination was not carried out and we had no detailed information about the medical history of the study population such as type and duration of medical

disorders. The above mentioned limitations may influence our findings. And finally, follow-up were not carried out.

Declarations

Ethics approval and consent to participate: The study protocol conforms to the ethical guidelines of the 1975 Declaration of Helsinki as reflected in a priori approval by the Regional Ethical Committee at the University of Pécs, Pécs, Hungary as seen above.

Availability of data and materials: The dataset supporting the conclusions of this article is available on request to the corresponding author

Competing interests: The authors declare that they have no competing interests

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Authors' contributions: All authors equally contributed to the manuscript including study concept and design, collection of data, analysis and interpretation of data, writing of manuscript and critical revision of manuscript

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Tables

Table 1. Baseline characteristics of the study population

(N=1817)	%
Gender	
Female	1194 (65.7%)
Male	623 (34.3%)
Age	
18-25 years	46 (2.5%)
26-35 years	217(11.9%)
36-45 years	577 (31.8%)
46-55 years	602 (33.1%)
56-62 years	285 (15.7%)
more than 62 years	90 (5.0%)
Marital status	
single	263 (14.5%)
relationship	257 (14.1%)
married	1082 (59.5%)
divorced / widow	215 (11.9%)
Number of children	
have no children	419 (23.1%)
1 child	414 (22.8%)
2 children	706 (38.9%)
more than 3 children	278 (15.2%)
Work schedule	
regular	1735 (95.5%)
shifts	82 (4.5%)
Graduation	
elementary	9 (0.5%)
secondary education	105 (5.8%)
higher education	1703 (93.7%)
Years spent with work	

1-12 months	54 (2.9%)
1-5 years	205 (11.3%)
6-10 years	263 (14.5%)
11-20 years	584 (32.1%)
21-30 years	383 (21.1%)
31-40 years	288 (15.9%)
more than 40 years	40 (2.2%)
Secondary employment	
no	1584 (87.2%)
yes	233 (12.8%)

Table 2. Concomittant diseases. substance abuse and internet use in the study population

Concomittant diseases (%)	
taking any medications regularly	495 (27.2%)
smoker	275 (15.1%)
taking alcohol	93 (5.1%)
taking drugs	52 (2.9%)
diabetes	135 (7.4%)
hypertension	414 (22.8%)
cardiovascular disease	186 (10.2%)
musculoskeletal pain	146 (8.0%)
history of depression	27 (1.5%)
Daily internet use (approximately) (%)	
1 hour	696 (38.3%)
2 hours	569 (31.3%)
3 hours	287 (15.8%)
4 hours	132 (7.9%)
5 hours	54 (2.9%)
6 hours	44 (2.4%)
> 6 hours	35 (2.0%)
Daily time interval of internet use (multiply answer) (%)	
between 0-3 am.	186 (10.2%)
between 3-6 am.	75 (4.1%)
between 6-9 am.	233 (12.8%)
between 9-12 am.	349 (19.2%)
12-3 pm	209 (11.5%)
3-6 pm.	441 (24.3%)
6-9 pm.	943 (51.9%)
9-12 pm.	357 (19.6%)
Goal of internet use (multiply answer) (%)	
learning/working	1689 (93.0%)

internet gaming	159 (8.7%)
chat	410 (22.6%)
community portal (Facebook. Twitter etc)	773 (42.5%)
matchmaking	52 (2.9%)
movies	328 (18.1%)
music	539 (30.0%)
other	196 (10.8%)

Table 3. Comparison of baseline characteristics of the study subgroups.

	Not addicted to internet (n= 1722)	Internet addiction (n= 95)
Gender		
Male	564 (32.7%)	59 (62.1%)*
Female	1158 (67.2%)	36 (37.9%)
Age (years)		
18-25 years	39 (2.3%)	7 (7.4%)*
26-35 years	196 (11.4%)	21 (22.1%)*
36-45 years	543 (31.5%)	34 (35.8%)
46-55 years	585 (34%)	17 (17.9%)*
56-62 years	273 (15.8%)	12 (12.6%)
more than 62 years	86 (5%)	4 (4.2%)
Marital status (%)		
single	241 (14%)	22 (23.1%)*
relationship	240 (14%)	17 (17.9%)
married	1037 (60.2%)	43 (45.3%)*
divorced / widow	202(11.7%)	13 (13.7%)
Number of children		
having no children	386 (22.4%)	33 (34.7%)*
1 child	390 (22.6%)	24 (25.3%)
2 children	683 (39.7%)	23 (24.2%)*
more than 3 children	263 (15.3%)	15 (15.8%)
Work schedule		
regular	1643 (95.4%)	92 (96.8%)
shifts	79 (4.6%)	3 (3.2%)
Graduation		
elementary	6 (0.3%)	3 (3.2%)**
secondary education	108 (6.3%)	7 (7.4%)
higher education	1618 (96.9%)	85 (89.5%)
Years spent with work		

1-12 months	47 (2.7%)	7 (7.3%)*
1-5 years	191 (11.1%)	14 (14.7%)
6-10 years	246 (14.3%)	17 (17.9%)
11-20 years	547 (31.8%)	37 (38.9%)
21-30 years	373 (21.7%)	10 (10.5%)*
31-40 years	281 (16.3%)	7 (7.4%)*
more than 40 years	37 (2.1%)	3 (3.2%)
Secondary employment		
no	1503 (87.3%)	14 (14.7%)
yes	219 (12.7%)	81 (85.3)**

****p<0.001**

***p<0.05**

Table 4. Comparism of concomittant diseases. substance abuse and internet use in the study subgroups.

	Not addicted to internet (n=1722)	Internet addiction (n=95)
Concomittant diseases		
taking any medication regularly	475 (27.6%)	20 (21.1%)
smoker	242 (14.1%)	33 (34.7%)**
taking alcohol	76 (4.4%)	17 (17.9%)**
taking drugs	37 (2.1%)	15 (15.8%)**
diabetes	122 (7.1%)	13 (13.7%)*
hypertension	387 (22.5%)	27 (28.4%)
cardiovascular disease	175 (10.2%)	11 (11.6%)
musculoskeletal pain	136 (7.9%)	10 (10.5%)
history of depression	19 (1.1%)	8 (8.4%)**
Daily internet use (approximately)		
1 hour	684 (39.7%)	12 (12.6%)**
2 hours	552 (32.1%)	17 (17.9%)*
3 hours	265 (15.4%)	22 (23.2%)*
4 hours	114 (6.6%)	18 (18.9%)*
5 hours	46 (2.7%)	14 (14.7%)**
6 hours	30 (1.7%)	4 (4.2%)
> 6 hours	31 (1.7%)	8 (8.4%)**
Daily time interval of internet use (multiply answer)		
between 0-3 am.	178 (10.3%)	8 (8.4%)
between 3-6 am.	69 (4%)	6 (6.3%)
between 6-9 am.	218 (12.7%)	15 (15.8%)
between 9-12 am.	335 (19.5%)	14 (14.7%)
12-3 pm	196 (11.4%)	13 (13.7%)
3-6 pm.	410 (23.8%)	31 (32.6%)
6-9 pm.	894 (51.9%)	49 (51.6%)
9.12 pm.	332 (19.3%)	25 (26.3%)
Goal of internet use (multiply answer)		

learning/working	1613 (93.7%)	76 (80%)**
internet gaming	135 (7.8%)	24 (25.2%)**
chat	372 (21.6%)	38 (40)**
community portal (Facebook. Twitter etc)	724 (42%)	49 (51.6%)
matchmaking	41 (2.4%)	11 (11.6%)**
movies	308 (17.9%)	20 (21%)
music	514 (29.8%)	25 (26.3%)
other	188 (10.9%)	8 (8.4%)

****p<0.001**

***p<0.05**