



Internet Addiction in Adolescents

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Abstract: *The possibilities offered by the use of the Internet increasingly intensify the problem of Internet addiction, which has become more prevalent in the last decade, marked by the growing availability of mobile devices and new media and their exacerbation of the problem. Research on Internet addiction, initiated by Kimberly Young at the end of the twentieth century, usually appears in the literature in the context of young people who have been found to be most vulnerable. The phenomenon is known as Adolescent Internet Addiction. Compulsive use of the Internet is a complex phenomenon, its effects being visible in almost all aspects of a young person's social life. It is manifested in a variety of pathological behaviors and emotional states grouped into several major psycho-physical and social effects that may appear simultaneously, e.g. anger, depression, loneliness or anxiety associated with the lack of access to the network, the weakening of social ties, withdrawal from real life, lack of educational achievement, chronic fatigue or deteriorating health. The authors of this study aim to assess the level of Internet addiction among adolescents in Poland and indicate its main behavioral manifestations, in the students surveyed, which influence their pathological use of the Internet. Our study involved a total of 505 students from three high schools located in Rzeszow (N = 505) and was carried out by questionnaires, including, among others, The Problematic Use of the Internet (PUI) which is the Polish adaptation of Kimberly Young's Internet Addiction Test (IAT) (Cronbach's $\alpha = 0.89$). Statistical analysis of responses from the PUI test allowed us to determine (1) the level of Internet addiction among these adolescents, whereas the univariate (ANOVA) analysis enabled us (2) to verify the hypothesis of the existence of differences in the level of Internet addiction among the investigated groups as far as gender, place of residence or grade are concerned. Generally, the results obtained in our research indicate that the level of Internet addiction among the adolescents*

investigated is not very high, although two thirds of our respondents showed an above average level of addiction, and every ninth respondent (approximately 11%) was highly addicted to the Internet, men being more often addicted (15.6%) than women (8.3%).

Keywords: Internet addiction, adolescents, Test of Problematic Use of the Internet (PUI), factor analysis (ANOVA)

Introduction

The possibilities offered by the use of the Internet increasingly intensify the problem of Internet addiction. This has become more prevalent in the last decade (Kuss, Shorter, van Rooij, Griffiths, & Schoenmakers, 2013), marked by the growing availability of mobile devices and new media and their exacerbation of the problem (Kuss, van Rooij, Shorter, Griffiths, & van de Mheen, 2013).

Internet addiction is part of the group of so-called *new addictions*, which represents various socially problematic activities and behaviours. These are addictions in which the ingestion of chemical substances play, no role. Apart from the Internet, they include addiction to gambling, shopping, sex work, food or emotional dependency (Guerreschi, Marazziti, & Wiczorek-Niebielska, 2006). Many terms are used to define the phenomenon under discussion here, among them *Internet Addiction* (K.S. Young, 1998), *Pathological Internet Use* (Davis, 2001) and *Problematic Internet Use* (Shapira et al., 2003; Yellowlees & Marks, 2007).

Studies on Internet addiction were initiated by Kimberly S. Young at the end of the twentieth century (Kimberly S. Young, 1998). Young believes that Internet addiction should be regarded as a habit and impulse disorder, similar to pathological gambling. She also points out that this type of addiction visibly deteriorates an individual's functioning in every sphere of life (Shapira et al., 2003; K.S. Young, 1998). An attempt to define compulsive use of the Internet was also made by Griffiths (2000), who defined it as compulsive behaviour involving an individual's excessive interaction with the computer and, which follows, with the Internet. This can take two forms: passive, consisting in browsing through web pages and active, manifested by playing interactive online games.

As Young (1998) points out, Internet addition is a heterogeneous and complex process. It destructively affects every sphere of a young person's life, expressing itself in various pathological behaviours and emotional states, which can be grouped into a few main psycho-physical and social units that may occur simultaneously. School duties and studying are often neglected as a result of spending too much time with the Internet. Family ties and friendships are loosened as priority is given to contacts established online. Physically the addiction can express itself in sleeplessness, fatigue, bad eating habits and lack of physical activity (Douglas et al., 2008; Lai et al., 2015; Waldo, 2014; Yu, Kim, & Hay, 2013). Some of the mental symptoms of web-alcoholism should be also mentioned here. Social phobias linked to avoiding human contact in the real world, distorted non-verbal communication and depression caused by reduced access to the virtual world are only some of them (Gajda, 2011).

Research to date indicates that spending excessive time in cyberspace may contribute to increased levels of social isolation and depression (Chou, Condron, & Belland, 2005). Compulsive use of the Internet may also inhibit the creation of healthy social interactions and, in this way, increase feelings of loneliness (Rębisz, Sikora, & Smoleń-Rębisz, 2016). In the worse-case scenario, Internet addiction may result in personality disorders or even hinder development (Bednarek & Andrzejewska, 2009).

Research on web-alcoholism conducted to date demonstrates that young people are most exposed to Internet addiction (Leung, 2007; Mossbarger, 2008). This phenomenon, known as *Adolescent Internet Addiction (AIA)* (Waldo, 2014), is said to result from the fact that adolescent needs can be easily met in the online world, among them the need to establish and maintain contacts, seek answers to the most vital questions, seek self-expression or build self-identity (Aydm & San, 2011; Lai et al., 2015). Home environment is very important in this context. The absence of strong family relations, insufficient parental involvement or being brought-up in a single parent family are among the main reasons why young people increasingly reach for the Internet (Ni, Yan, Chen, & Liu, 2009; Wąsiński & Tomczyk, 2015). Internet addiction among adolescents is also determined by school and peer factors, such as overloaded curricula that students find excessively burdensome, a shortage of authority among teachers as well as difficult peer relations and an inability to communicate (Bednarek & Andrzejewska, 2009).

The reasons behind web-alcoholism among adolescents should be sought not only in their environment but also in various internal factors, such as social phobia, depression and loneliness (Yao & Zhong, 2014). *Bednarek and Andrzejewska* (2009) mention such predictors as low self-esteem, emotional immaturity, lack of ability to cope with suffering and stress, negative self-image or inability to establish interpersonal contacts. *Woronowicz* (2001) distinguishes the following symptoms of Internet Addiction based on ICD-10 (International Statistical Classification of Diseases and Related Health Problems) criteria: (1) the need or compulsion to use the Internet (2) subjective belief in one's difficulties to control the Internet-related behaviour (3) restlessness, anxiety or discomfort when attempting to discontinue the use of the Internet and persistence of these symptoms upon logging back into the virtual world (4) spending more time in the cyber world in order to achieve satisfaction and well-being, which previously took less time (5) a growing neglect of alternative interests and pleasures in favour of Internet use, and (6) the use of Internet despite of an awareness of its harmful effects. The occurrence of three of the above symptoms within a year can be already interpreted as Internet addiction (Majchrzak & Ogińska-Bulik, 2010).

The goals set out by the authors of this study were as follows: (1) to evaluate the level of Internet addiction among secondary school pupils in Rzeszów (2) to indicate the main symptoms/behaviours that have an influence on the pathological use of the Internet (3) to test our hypothesis about the existence of differences in the level of the examined phenomenon in the groups compared, taking into consideration such variables as gender, place of residence, age and grade.

Methods

Sample

505 students of secondary schools were recruited for the study, all from the three Rzeszów second-level general education secondary schools (*liceum*) (N=505). Our sampling was random purposive. The study was conducted at the turn of 2014 and 2015. The social-demographic characteristic of our subjects is presented in Table 1.

Table 1. The socio-demographic characteristics of the sample (N=505)

Characteristic	%/mean (SD)
Sex	
Men	33,9%
Women	66,1%
Age (years)	16,7 (0.851)
School Grades	
1st	51,9%
2nd	37,4
3rd	10,7%
Place of residence	
City/Town	39,6%
Village	60,4%

Note: SD - standard deviation

Measures

We developed an original questionnaire which involved 14 questions with the option of selecting one or more answers. When working on the questionnaire, we made sure that the questions contained the problems defined by Woronowicz and Young as risk factors and symptoms of Internet addiction. In order to identify the addiction levels we also included Ryszard Poprawa's *Test of Problematic Use of the Internet* (PUI) (Poprawa, 2011), which is the Polish adaptation of Young's Internet Addiction Test (IAT) (Kimberly S. Young, 1998). The Polish version of the test consists of 22 statements/questions regarding the use of the Internet and respondents are asked to choose one of the six answers on the scale 0-5, where 0 means "never" and 5 means "always." The level of Internet addiction is specified as (a) very low (b) low (c) average (d) high (e) very high. In order to estimate the level of Internet addiction every answer to the PUI items was attributed a number of points. Responses to the 22 questions/statements in the Polish version of the test can yield from 0 to 110 points. The level of Internet addiction is determined based on the following intervals: 0-1 very low; 2-10 low; 11-49 average; 50-79 high; 80-110 very high. Cronbach's alpha for the scale was $\alpha = 0.89$, which means the research tool is highly reliable.

Additionally, the single-factor analysis of variance (ANOVA) was applied in order to review our hypothesis of the existence of differences in the level of Internet addiction in the groups we studied, involving 4 independent variables, i.e. gender, place of residence, age, grade and 14 dependent variables (see Table 3).

Results

Of 505 respondents, 456 completed our questionnaires which were then considered valid for the purposes of our study. The material revealed that 99% of students in our sample have access to the Internet and 98% had used the Internet for longer than 3 years. Almost 88% of our interviewees logged on to the Internet every day and two thirds of them declared that they spend at least 2 hours a day using the Internet. Interestingly, almost every third respondent (29.7%) spent 4 hours a day or longer using the Internet. Our respondents used the Internet primarily at home, mostly through two types of device: computer (95%) and telephone/smartphone (82%). Our data demonstrates that young people mostly use the Internet to stay in touch with other users, primarily through social media (74%) or chat applications (48%). They also actively use educational resources available through the Internet (47%) and seek information relevant to their lives (38%). These percentages do not sum up to 100 because students were given an option to select more than one answer.

In general terms, our results indicate that our respondents were not addicted to the Internet to an extent that can be regarded as strong. In fact, two thirds of them reached the average score (men 68.8% women 77.25%). Every ninth respondent (approx. 11%) scored high in the Internet addiction level, with male students being more often addicted (15.6%) than female (8.3%) – Table 2.

Table 2. Internet Addiction Levels and Gender - *Test of Problematic Use of the Internet (N=456)*

Addiction level	Women	Men	Total
Very low (0-1)	0.7%	5.2%	2.2%
Low (2-10)	13.9%	9.1%	12.3%
Average (11-49)	77.25%	68.8%	74.3%
High (50-79)	8.3%	15.6%	10.7%
Very High (80-110)	0%	1.3%	0.4%

Note: point intervals for each level of addiction have been specified in brackets

The analysis of responses given in the PUI test helped us distinguish five types of behaviour among the adolescents in our sample, which influenced the level of Internet addiction. Our respondents most frequently replied “often” or “always” to the following statements: (1) *I find that I stay online longer than I intended* – 30.8% (Mean=2.649; SD=1.546); (2) *I often find myself saying “just a few more minutes”* – 26.2% (Mean = 2.254; SD = 1.594); (3) *My grades or school work suffer because of the amount of time I spend online* – 14.4% (Mean = 1.752; SD=1.456); (4) *I fear that life without the Internet would be boring, empty and joyless* – 14.2% (Mean=1.542; SD=1.514); (5) *I often neglect household chores in favour of spending time online* – 14.1% (Mean=1.971; SD=1.349).

In order to capture the differences in the type of factors selected by various groups of respondents, we carried out the single-factor analysis of

variance (ANOVA), which allowed for a review of the hypothesis about the existence of differences in the level of investigated phenomenon in the groups we compared (Dodge, 2008; Rubacha, 2008, pp. 244–248). The analysis showed that out of 4 independent and 14 dependent variables, those that differentiated between the various levels of Internet addiction are one independent variable: (1) *gender* ($p=0.032$), and 6 dependent variables: (1) *the period (number of years) of Internet use* ($p=0.038$); (2) *frequency of logging on to the Internet* ($p=0.001$); (3) *time spent online* ($p=0.001$); (4) *playing online games* ($p=0.001$); (5) *using Internet for purposes other than educational* ($p=0.001$). Another statistically significant variable was (6) *using computer to log on to the Internet* ($p=0.002$). The remaining categories have not shown a statistically significant difference ($p>0.05$) – Table 3.

Table 3. Single-factor analysis of variance (ANOVA) – *Test of Problematic Use of the Internet* (N=456)

Factor(s)	Mean	SD	Sig.
Gender	2.327	.806	.032
Age	2.327	.806	.103
Place of residence	2.324	.806	.228
Grade	2.327	.806	.128
Length of Internet use – number of years	2.320	.800	.038
Frequency of Internet use	2.320	.800	.001
Time spent online	2.321	.801	.001
Place of Internet use (home, school etc.)	2.320	.801	.077
Logging on to the Internet to look for information/the latest news	2.320	.798	.404
Logging on to the Internet to download (music, films etc.)	2.320	.798	.237
Logging on to the Internet to talk to others (chat services, communicators, fora)	2.320	.798	.476
Logging on to the Internet to share in social media activity (Facebook, Twitter etc.)	2.320	.798	.161
Logging on to the Internet to shop and take part in auctions	2.320	.798	.295
Logging on to the Internet to play online games	2.320	.798	.001
Logging on to the Internet for other than educational purposes	2.320	.798	.001
Using computer to log on to the Internet	2.309	.780	.002
Using telephone/smartphone to log on to the Internet	2.309	.780	.735
Using tablet to log on to the Internet	2.309	.780	.395

Note: $p<0.05$

Discussion

Internet usage is now an integral part of children's and teenagers' everyday life. According to Kirwil (2011), in 2010 Europe, on average 93% of young people used the Internet at least once a week, and 60% were logged on every day or almost every day. In Poland, these rates were even higher: 98% were logged on at least once a week and 74% every day. It can be assumed that in the following years these percentages were even higher. The importance of the Internet in everyday life has been confirmed by

studies carried out in Poland in 2010-2012 which, among other related issues, investigated the most important media used in different age groups. The results demonstrate that for teenagers from 15 to 19 years of age the most important medium is the Internet (*World Internet Project. Poland, 2012*).

Mobility and Internet access when used unreasonably carry a serious risk of Internet addiction, which most commonly affects young people. The research discussed in this paper allowed us to define the level of Internet addiction among the adolescents we surveyed and indicate the main behaviours that determine compulsive Internet usage. Moreover, single-factor analysis (ANOVA) helped us review the hypothesis about the existence of variables that significantly differentiate between various levels of addiction to the online world.

Generally, the results of our research show *an average level of Internet addiction* among Rzeszów secondary school students. Over two thirds of our respondents scored 11 to 49 out of 110 possible points. Low and very low levels of Internet usage were declared by 14.5% of them. On the other hand, every ninth respondent (approx. 11%) scored high level of problematic use of the Internet - see Table 2. Our results are consistent with other Polish research on Internet addiction (Kirwil, 2011; Kołłątaj, Szakula, Kołłątaj, Wrzolek, & Karwat, 2013; Livingstone, Haddon, Görzig, & Ólafsson, 2011; Potemska & Pawłowska, 2010).

As already mentioned the *gender* of our respondents turned out to be a significant differentiating variable ($p=0.032$). In the surveyed population, it is male students that showed high and very high levels of problematic use of the Internet (almost 17 %). The percentage was lower when it came to the female students we surveyed and was slightly in excess of 11%. Our research demonstrated that every sixth male and every ninth female respondent uses the medium pathologically. A higher level of Internet addiction in men than women has been also revealed by the recent study conducted by Szkoła Wyższa Psychologii Społecznej (University of Social Sciences and Humanities) in Warsaw. Their results demonstrate that, based on the group of five symptoms they propose to define Internet addiction, more girls (45%) than boys (38%) experience no symptoms of Internet addiction at all (Kirwil, 2011). Similar conclusions were reached by Yang (2001). Based on the sample of 1296 people, she concluded that more boys than girls are in danger of meeting the criteria for Internet addiction as they tend to be more often dependent on the Internet (Yang, 2001). Also research conducted by Ko, Yen, Chen, Chen, Wu and Yen (2006), as well as Yen, Ko, Yen, Chen and Chen (2009) confirms that men use the Internet to destructive effect more often than women, and the likelihood of their addiction to the medium is higher. Another Polish survey by Pawłowska and Potemska (2010) has confirmed that boys spend more time online than girls. They also tend to either trivialize or justify their online activities. Boys display a tendency to subtract the time spent online from the time that would have otherwise spend sleeping. The virtual world is in the case boys more often treated as escape from negative thoughts about their own life.

Another statistically significant dependent variable in the context of the problem discussed in this paper is *the length of the period (number of years) of Internet usage* ($p=0.038$). It appears that the problematic

Internet usage among the surveyed students decreases with the total number of years of Internet usage. Those of our respondents who had used the Internet only for a short time, for less than a year, turned out to show the highest number of behaviours linked with compulsive use of the Internet ($Mean = 3.388$, $SD = .213$), whereas those who used the Internet for longer than 4 years showed much more restraint in this respect ($Mean = 2.305$, $SD = .788$). The fact that the level of problematic Internet usage decreases with the length of the period in which users have been taking advantage of the Internet is probably linked to the huge variety of possibilities that the Internet offers. Users who have only recently discovered the virtual world are practically “attacked” by the messages and stimuli it offers. It therefore comes as no surprise that they are willing to sacrifice their contacts with others in the real world, study time or even health. More experienced users who have used the Internet for longer than 4 years cope much better with the selection of content and they find the information they are seeking much faster. They also have regular pages, services and “places” they visit so they spend less time searching, comparing and choosing their options. With some optimism it can be assumed that over their years of Internet use they have already experienced its negative effects so they consciously reduce the time they spend online, appreciating what off-line life has to offer.

Another essential variable which determines problematic Internet usage in a statistically significant way is the *frequency of being logged on to the Internet* ($p=0.001$). It transpires that people who declare an everyday logging on to the Internet were most often using it pathologically ($Mean = 2.371$, $SD = .791$). This situation may result from the fact that the Internet provides an answer to the needs of young people and, in particular, fulfils their need for contact with others. This is also confirmed by our research. Teenagers use the Internet primarily for contact with other users through social media (74%) or chat services (48%). The situation is similar in the context of the *time spent online* ($p=0.001$). Students who declared that they spent 5 or more hours a day online ($Mean = 2.834$, $SD = 1.134$) had more problems related to its excessive usage. The declared time of 5 or more hours spent in the virtual world, which is two and a half times longer than the average time spent online, becomes a distinct predictor of potential addiction. Internet users in Poland spend approximately 2 hours a day online (*World Internet Project. Poland, 2012*).

It also comes as no surprise that another variable, i.e. *using the Internet to play online games* ($p=0.001$), is statistically significant. Research to date indicates that this behaviour is a predictor of Internet addiction (Blinka & Smahel, 2011; Griffiths, 2000). Our analysis shows that problematic Internet usage occurred particularly in students who declared that they play online games ($Mean = 2.822$, $SD = .966$). Similar problems with compulsive use of the Internet were shown by those respondents who used it for *other than educational purposes* ($p=0.001$; $Mean = 2.500$, $SD = .858$) and *use a computer to log on to the Internet* ($p=0.002$; $Mean = 2.335$, $SD = .773$) rather than a telephone/smartphone ($p=0.735$) or tablet ($p=0.395$).

Our results allow for the conclusion that because of the specific patterns of Internet usage by adolescents, parents stand a good chance of becoming aware of the first symptoms of Internet addiction. 29.7% of the adolescents

we surveyed declared that they spent more than 4 hours a day online, whereas 95% of them used the Internet on a computer at home. It can therefore be hypothesized that the time spent online is mostly after school when under adult supervision. With computers being less mobile than other devices children can hardly conceal their use of the Internet from their parents. In this context parents should be able to notice any worrying symptoms and respond accordingly, although research shows that the much needed response is not always in place. Only 39.3% our respondents at the second-level secondary school level had a family member comment on their excessive use of the computer. Among those, 22% had an adult comment on it rarely and only 17.3% admitted to being frequently warned against excessive use of the Internet (Kołłataj et al., 2013).

Conclusion

As the problem of Internet addiction was only reported by 11% of our respondents, the results of our research might raise no major fears. Yet it should be considered that the scale of Internet addiction is often underestimated, as some of the people in research samples might be concealing their problem. On the other hand, in relation to the whole population of teenagers, the 11% of addicted teenagers revealed by our study translates into thousands of young people who might need help, which is why the problem of excessive Internet usage should not be marginalized. Research indicates that addictive Internet usage is a tangible threat which can have a considerable impact on the lives of adolescent users. It is therefore important to take action to counteract this problem. As school and home are the two main areas of a young person's life, these two environments in particular should be ones in which pathological Internet usage by adolescent users is tackled. Teenagers should also be encouraged to reflect on the situation. A critical approach to their own behaviour, as well as a response to any such worrying behaviour on the part of their peers, may help many get rid of the problem or even prevent it. In order to avoid excessive Internet usage adolescents should (1) use the Internet rationally, self-regulating the time they spend online and considering the purpose for its use, (2) develop social competences in the actual world through frequent contacts with family, friends and acquaintances and learn to value face to face meetings (3) get involved in the life of the school and other forms of activities offered by educational institutions (4) be aware of the threats lurking in the online world and of the effects of Internet addiction, and (5) treat the Internet as a tool providing help with various problems of the real world rather than its substitute.

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