

THE RELATION BETWEEN EMOTIONAL INTELLIGENCE AND INTERNET ADDICTION IN KATOWICE HIGH SCHOOL STUDENTS

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SUMMARY

Background: Emotional intelligence (EI) is described as the capacity to be aware of, control, and express one's emotions, and to handle interpersonal relationships judiciously and empathetically. It is considered as one of the most important predictors of success, quality of relationships, and overall happiness. Dynamically changing environment of the youth and young adults in recent years may influence their EI development, affecting their lives significantly. The purpose of this study was to analyse the way how the Internet is used by high school students, to determine the amount of time they spend on the Internet, identify the level of EI and to explore if there is any correlation between those factors.

Subjects and methods: 1450 high school students from Katowice, at the age from 18 to 21 years took part in an anonymous survey consisting of three parts: The Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF), Internet Addiction Test and authorial test giving information about the way of spending time online. The questionnaires were collected from May 2018 to January 2019.

Results: 1.03% of the respondents fulfilled the Internet addiction criteria. Students at risk for addiction (33.5%) turned out to be a larger group. A statistically significant correlation between TEIQue-SF and Internet Addiction Test score ($P < 0.0001$, $r = -0.3308$) was observed. Another significant correlation was found between TEIQue-SF score and amount of time spend on the Internet ($p < 0.0001$, $r = -0.162$).

Conclusion: A significant part of high school students used Internet excessively. Such behaviours were positively correlated with lower EI test results.

Key words: emotional intelligence - Internet addiction - high school students

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INTRODUCTION

We currently live in the era of the Internet and the ubiquity of mobile devices that allow an easier access to many resources, including information, entertainment and communication. Using them allows one to improve the standard of living, and their multi-tasking offers vastness of possibilities. However, despite their benefits, they also carry many risks.

Along with the increase of the Internet accessibility, which can now be used almost in any place, at anytime, anywhere in the world, the IA problem is growing. Depending on the severity of the addiction, it may cause various degrees of negative effects on personal and family life, interpersonal relations, emotional disorders, problems in fulfilling duties and many others. One of the symptoms is the so-called 'losing sense of time on the web' - the time that is not used for work or study and for one of the subtypes IA, i.e. Internet gaming disorder - the phenomenon of tolerance (the need to spend more and more time on computer games to achieve the same "high") which Jorgenson et al. (2016) mention in her work. In this case, adolescents and young adults are particularly vulnerable group in our society.

There are many risk factors for IA. Khoshakhlagh and Faramarzi (2012) in their work report that anxiety, obsessive-compulsive, aggression, phobia, hypochondria disorders, and emotional intelligence (EI) were the most significant predictors of Internet addiction. Our attention was mainly drawn to emotional intelligence, whose relationship with IA is reported in many publications. Salovey and Mayer (1990) defined EI as 'a set of skills hypothesized to contribute to the accurate appraisal and expression of emotion in oneself and in others, the effective regulation of emotion in self and others, and the use of feelings to motivate, plan, and achieve in one's life.' It follows that EI is essential for proper functioning in society, and its irregularities cause serious disorders.

There are gender-wise differences in the values of the above factors. According to Saraiva et al. (2018) women show a higher EI level and a lower level of IA compared to men, which confirms their inverse relationship. Strittmater et al. (2015) in her work noticed that PIU (Problematic Internet Use) players are more often boys/men who also have problems in dealing with peers, whereas female Internet users are more often "non-gamers", however, they exhibit greater exposure to depressive disorders. Both groups have shown a higher

level of disorders, i.e. depression, ADHD, behavioural disorders and more self-harming tendencies towards oneself compared to the average Internet user.

Not insignificant are the fear and depression mentioned above, as Lee et al. 2014 showed in their research. The occurrence of these factors in childhood shows a significant relationship with the manifestation of IA in adolescence (Rammazi et al. 2018). Many works also provide information on an increased risk of depression for people with IA in later years of their lives. According to research conducted by Khoshakhlagh and Faramarzi (2012), women are much more exposed to depressive disorders. Numerous studies also confirm correlation between increased level of stress and IA.

As can be seen, the issue of EI and IA and their correlation is extremely complex and there are many other factors that also affect them. In our research we decided to check whether there is a relationship between IA and EI in the studied population. We also tried to determine if the amount of time spent on the Internet and what activities it is devoted to have an impact on adolescent IA.

SUBJECTS AND METHOD

1450 people were invited to participate, of whom 1200 were included in the study. 250 were rejected due to incomplete filling-in of the questionnaire or marking only the highest or lowest values in the TEIQ-SF test. The study group consisted of 539 (44.9%) women and 661 (55.1%) men aged 18 to 23 with an average number of 19.6 ± 0.8 years. The people were recruited in 33 upper-secondary schools in Katowice from May 2018 to January 2019. Among the respondents, the largest group were learners of technical secondary schools - 681 (56.7%) pupils. 500 (41.7%) of students attended high school, and 19 (1.6%) - vocational school.

The study was approved by the Head of the Department of Education and Sport in Katowice and headmasters of the institutions. Anonymous questionnaires were distributed during general education classes. The participants were familiarised with the subject and principles of the study and were informed about voluntary accession to it. The course was supervised by the teachers of particular classes in cooperation with the persons conducting the research.

In the study, the questionnaire consisted of four parts:

- A short questionnaire gathering basic information about the respondent, such as gender, date of birth and the type of school they attend.
- Questionnaire evaluating emotional intelligence - TEIQue-SF by K.V. Petrides (Siegling et al. 2015) adapted to Polish standards by Agata Wytykowska (Szczygieł et al. 2015). The scale is based on the long form of the TEIQue (Petrides and Furnham 2003) and consists of 30 items. It includes two items from each of the 15 facets of the TEIQue organised under four-factors: well-being, self-control, emotio-

ality, and sociability. Items were selected primarily on the basis of their correlations with the corresponding total facet scores, which ensured broad coverage of the sampling domain. They are either positive (15 items; e.g., "On the whole, I'm a highly motivated person.") or negative (15 items, e.g., "I often find it difficult to see things from another person's viewpoint"). Items were responded to on a 7-point Likert scale where 1 means strongly disagree and 7 means strongly agree. The result is obtained after summing the scores from positive sentences, and the reversed score from negative sentences. The higher the score, the higher the IE feature of the unit.

- Internet Addiction Test questionnaire (IAT), by Kimberly Young (adapted by Paweł Majchrzak and Nina Ogińska-Bulik to Polish conditions, 2007). It was created based on DSM-IV diagnostic criteria for pathological gambling. The questionnaire consists of 20 questions regarding various behaviours and feelings related to the use of the Internet, referring to, i.a., negligence of duties because of the Internet, as well as the control over the time spent on the Internet. There are possible answers from 1 to 5, indicating the frequency of each phenomenon (1 - rare, 5 - always). The sum of points falls within the range of 20 - 100. A score equal to or greater than 40 indicates the risk of Internet addiction, and a score equal to or greater than 70 indicates respondent's excessive use of the Internet.
- Author's questionnaire collecting information on the amount of time spent on the Internet. The sheet includes the number of hours spent on the Internet by the student on a school day and on a day off from school. The respondents also determined how many hours of that time they used the Internet on mobile devices (e.g. smartphone, tablet). The respondents determined how much time on average during the day they devote to the mentioned sub-items by selecting 1 of 8 possible time intervals (a-no time whatsoever, b - 1-15 minutes, c - 16-30 minutes, d - 31-60 minutes, e - 1-2 hours, f - 2-3 hours, g - 3-4 hours, h > 4 hours).

RESULTS

Due to missing answers in the tests TEIQ and IAT, 250 people were removed from the analysis. After counting them out, the research group consisted of 1200 people, of which 539 (44.9%) were women. 500 (41.7%) students attended high school, 681 (56.7%) technical college and 19 (1.6%) - vocational school. The average age of the respondents was 19.6, $SD=0.8$ (Table 1).

An inverse correlation was found between the results of tests surveying emotional intelligence and Internet addiction in our research group (Figure 1.) with a score of $P < 0.0001$ and $\rho = -0.317$. The normal distribution of IAT and TEIQ results in the study group with the Shapiro-Wilk test $p < 0.05$ was rejected, therefore Spearman's rank correlation was used to investigate the relationship between IAT and TEIQ results (Table 2, 3).

Table 1. Participants sociodemographic, TEIQ and IAT test scores (n=1200)

Gender	
Women	539 (44.9)
Men	661 (55.1)
Age (years), Arithmetic mean (SD)	19.6 (0.8)
Type of high school	
High school	500 (41.7)
Technical secondary school	681 (56.7)
Vocational school	19 (1.6)
Average time spent in the internet during week (hours), Arithmetic mean (SD)	4.5 (2.67)
Average time spent in the internet during weekend (hours), Arithmetic mean (SD)	5.8 (3.32)
Average score from TEIQ, Arithmetic mean (SD)	4.62 (0.8)
Average score from IAT, Arithmetic mean (SD)	38.19 (12.31)
Participants who get < 40 from IAT	765 (63.7)
Participants who get ≥ 40 from IAT	409 (34.1)
Participants who get > 70 from IAT	26 (2.2)

Abbreviations: SD = Standard deviation; TEIQ = Trait Emotional Intelligence Questionnaire; IAT = Internet addiction test; Data are presented as number (percentage) of patients if not stated otherwise

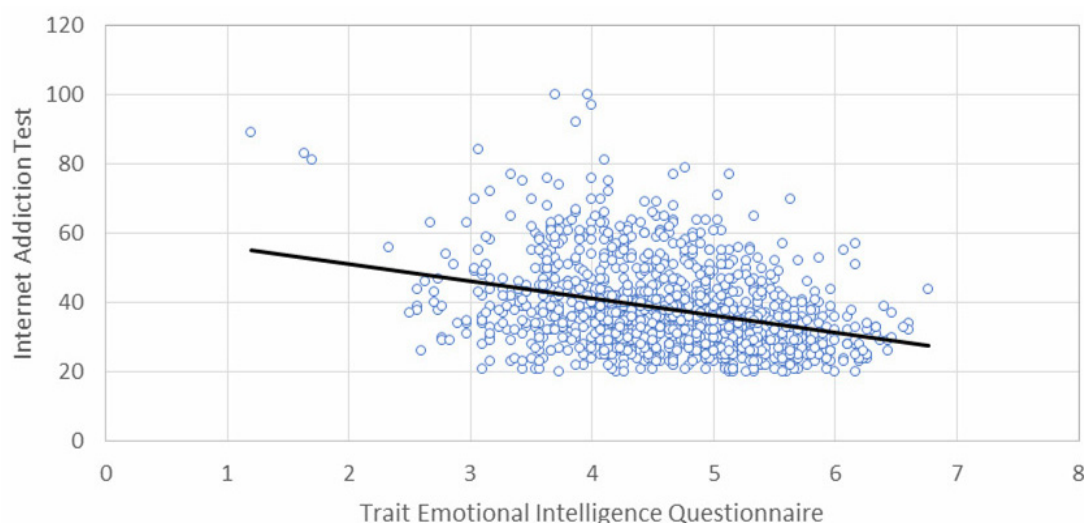


Figure 1. Correlation coefficient between Internet Addiction Test score and Trait Emotional Intelligence Questionnaire test score (n=1200, $p < 0.0001$, $\rho = -0.317$)

Table 2. Differences between gender (n=1200)

	Women	Men
Average score from TEIQ, Arithmetic mean (SD)	4.46 (0.78)*	4.75 (0.79)*
Average score from IAT, Arithmetic mean (SD)	37.77 (11.51)	38.52 (12.92)
Participants who get ≥ 40 from IAT	183 (33.95)	226 (34.19)
Participants who get > 70 from IAT	7 (1.3)	19 (2.87)

Abbreviations: SD = Standard deviation; TEIQ = Trait Emotional Intelligence Questionnaire; IAT = Internet addiction test; Data are presented as number (percentage) of patients if not stated otherwise; * = statistically significant difference ($P > 0.05$)

Table 3. Differences between types of school

	High school	Technical secondary school
Average score from TEIQ, Arithmetic mean (SD)	4.58 (0.8)	4.66 (0.8)
Average score from IAT, Arithmetic mean (SD)	38.67 (11.19)*	37.81 (12.90)*
Participants who get ≥ 40 from IAT	186 (37.2)	218 (32.01)
Participants who get > 70 from IAT	6 (1.2)	19 (2.79)

Abbreviations: SD = Standard deviation; TEIQ = Trait Emotional Intelligence Questionnaire; IAT = Internet addiction test; Data are presented as number (percentage) of patients if not stated otherwise; * = statistically significant difference ($P < 0.05$)

Table 4. Indicators of emotional intelligence, well-being, self-control, emotionality and sociability on the basis of Trait Emotional Intelligence Questionnaire test

	Arithmetic mean	Standard deviation	Median	Interquartile range	Minimum	Maximum
Emotional intelligence	4.62	0.8	4.63	4.10-5.17	1.20	6.77
Well-being	4.54	1.32	4.67	3.67-5.50	1.00	7.00
Self-control	4.53	1.03	4.50	3.83-5.17	1.17	7.00
Emotionality	4.72	0.85	4.75	4.13-5.38	1.00	7.00
Sociability	4.66	1.03	4.67	4.00-5.33	1.00	7.00

The results of the TEIQ test of people at risk of the Internet addiction (IAT>40) and people addicted to the Internet (IAT>70) were compared with people who obtained less than 40 points in IAT. The Shapiro-Wilk test rejected the normal distribution of the TEIQ results in the group that obtained less than 40 points from the IAT test and the Kruskal-Wallis test was used due to the small number of people with the addiction to Internet. A statistically significant difference was found between these groups $p<0.005$.

DISCUSSION

The percentage of people with addiction in each study depends on the used test, used cut-off point and socio-cultural factors. Our results showed that 2.2% of respondents overuse the Internet and 34.1% are at risk of the overuse. "Internet Addictive Behavior in Adolescence: A Cross-Sectional Study in Seven European Countries" (Tsitsika et al. 2014), which also used an IAT test and the same cut-off point, shows symptoms of addiction in 1% of respondents and risk of addiction in 12.7%. A telephone survey conducted in Germany with use of Chen Internet Addiction (Rumpf et al. 2014) revealed probable Internet addiction at the level of 1.0% (CI 0.9–1.2) among the entire sample, 2.4% (CI 1.9–3.1) in the age group 14–24, and 4.0% (CI 2.7–5.7) in the age group 14–16. In a study conducted in Poland (Tabak & Zawadzka 2017), using Young's Diagnostic Questionnaire, 11.6% of respondents met the criteria of addiction and 8.2% were threatened with Internet addiction. The participants were 376 students, aged 14–19 ($M=16.04$; $SD=0.9$).

The average score of TEIQue-SF test for the group was 4.62 $SD=0.8$ (women=4.46 $SD=0.78$, men=4.75 $SD=0.79$) (Table 4). The average result for people with Internet addiction was 3.71, $SD=1.03$ and for those at risk of addiction 4.39, $SD=0.7$. The average age was 19.6 ($SD=0.8$). In a study conducted in Poland (Szczygieł et al. 2015) on participants aged from 18 to 29 years ($M=22.69$; $SD=2.40$), the average score of TEIQue-SF test was 4.83 ($SD=0.79$) for men and 5.06 ($SD=0.70$) for women. High school students 14 to 16 years old in Kanyakumari District, India, had the median score of TEIQue-SF at the level of 4.65 for boys and 4.53 for girls (Lawrence & Deepa 2013). In a similar study conducted on high school students aged

on average 15.2 ($SD=2.9$) in Sparta the median of TEIQue-SF test was 4.9 ($SD=0.6$) for boys and 4.8 ($SD=0.7$) for girls. The differences in test results may be caused by the age difference of the respondents (Chen et al. 2016), parental education, geographical origin, socio-economic status or even birth order (Akbar et al. 2011).

The results of our study show a moderate, inverse relationship between Internet addiction and the level of emotional intelligence ($p<0.0001$, $\rho=-0.317$). Students from 13–18 years of age ($M=16.2$, $SD=1.45$) residing in several communities in Central and Eastern Ontario were part of the study that examined the relationship between emotional intelligence (EI) and several addiction-related behaviours (gambling, using the Internet, and playing video games). The analysis revealed that EI is a moderate to strong predictor of addiction-related behaviours (Parker et al. 2008). Results of the study on undergraduate students aged 18-24 studying at Kharazmi University indicated that all the components of emotional intelligence are significantly, negatively correlated to the Internet addiction (Far et al. 2014). Despite the fact that many studies have shown no connection between emotional intelligence and Internet addiction (Maddi et al. 2013, Waldo et al. 2013), pooled results of thirteen studies regarding connection between Internet addiction and emotional intelligence revealed a moderate and inverse relation between Internet addiction and emotional intelligence (Ranjbar and Bakhshi 2018).

People with a high emotional level are more likely to enjoy their life and achieve long-term goals due to the greater awareness and control over their own and other people's emotions (Salovey and Mayer 1990). Study on students from colleges in Delhi showed that low emotional intelligence was associated with a higher level of anxiety and a higher likelihood of Internet addiction (Juneja and Sethi 2015). Individuals with poor affect regulation abilities may struggle with regulating distressing emotions due to difficulty in identifying subjective emotional states, and a limited ability to communicate these feelings to others. As a result, these individuals are unable to obtain the help or comfort needed from other people. It may also be possible that adolescents, who spend considerable amounts of using the Internet, do not develop good interpersonal abilities (Parker et al. 2008).

The self-medication model (Khantzian 1997) indicates that people can compensate for “deficiencies” in their real lives, such as poor relationships with people, lack of satisfaction with their achievements or negative emotions such as anxiety, through the use of the Internet. The computer network allows them to escape from the reality. People get pleasure out of the sense of control and connection with other users (Leung 2004). People with lower emotional intelligence are more likely to become addicted because they have less satisfying life in general.

Low levels of emotional intelligence are associated with weaker self-control. People with low emotional intelligence will be more susceptible to abandon their daily duties, associated with learning, working and interacting with others, for temporary online pleasure (Kim et al. 2017).

- The weak part of the study was that the students who were absent from classes did not participate in the research.
- Some of the completed questionnaires (250) were missing and were not taken into account.
- The cross-sectional study does not establish a causal connection, but only a correlation.
- The findings are also limited due to the research tools used in the study.

Using a broader range of assessment strategies (e.g. performance based or observer ratings) should provide more reliable results.

CONCLUSIONS

The results show that there is a risk of Internet addiction among students of upper-secondary schools. There is also a link between Internet abuse and emotional intelligence. They seem to confirm findings of other authors, demonstrating that the people who have problems with managing their own emotions and coexisting with others are more vulnerable to addiction.

In the current situation, when the Internet is entering the lives of almost every person from an early age, it is very difficult to predict the effects that it has on individual people and the society of future generations. In order to better understand the problem, it is necessary to conduct research not only on the mechanism and consequences of Internet addiction, but also on the way in which “ordinary” Internet use affects people and whole communities.

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