Information Addiction

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Abstract. *This paper discusses the possible existence of addictive models of behaviour concerning the constant input of data and information in the modern ICT environment. Furthermore the paper deals with addiction and attention deficit disorder related concepts, with reference to the theoretical basis and an overview of the most relevant existing work in this field. It is assumed that the above-mentioned addictive models of behaviour are related to attention deficit disorder symptoms in advanced ICT users. To verify this assumption, a research was conducted on a target sample of 100 respondents who fit the advanced ICT user profile. For research purposes, target behaviour criteria which help to recognize the investigated behaviours will be defined. The findings of the conducted survey are presented along with suggestions for further research.*

Keywords. ADD, attention disorder, addiction, information, Internet

1 Introduction

At the moment there are more than 1,802,330,457 Internet users worldwide, which is an increase of approximately 399.3% compared to the number of users in year 2000 [22]. According to the same source, 48.5% of the population in Europe has Internet access and the same statistical research shows that about 44.2% of population in Croatia also has Internet access.

In the modern Information and Communication Technology (ICT) environment tremendous amount of information is easily and instantly accessible via variety of products, which have become widely available and economically acceptable for professional and private use. "Traditional" sources of information like printed newspapers or magazines, are being substituted with multi-functional electronic devices which enable to store large amount of information in small physical dimensions. One of the example is the electronic book reader (e-book reader), which implements an e-ink technology in purpose of replicating printed publications with eye-pleasing high contrast displays, low power consumption and thin physical dimensions [5], [7], [18]. Along with e-book readers, there is a variety of other products that, besides their native functionality, offer numerous additional capabilities like network access (e.g. WiFi, Bluetooth, 3G), making calls/messages, reading/writing documents, playing multimedia files (audio, video and images), various sensor readings (e.g. air temperature, altitude, velocity, atmospheric pressure, heartbeats, blood pressure, burned calories), etc.

In developed countries in 21st century, it is difficult to imagine a professional or private activity without the intervention of ICT. It seems that people are largely attracted by the possibility of reading different parameters from digital LCD screens, and signals that are send from their own bodies through biological ways seems to be too complex for quick assessment because they can have instant gratification through easy available information. Information input could have different affects on brain activities. Brainwave entrainment is a process that causes brainwave frequencies to fall into synchronization with a periodic external stimulus having a frequency corresponding to the intended brain state [19]. External stimulus can be accomplished by ICT software [1], [3]. All of the

above mentioned leads to assumption that it is for more and more people harder to be with their own thoughts, without an external technological stimulants of any kind.

2 The research problem

This paper investigates the existence of addictive models of behaviour concerning the constant input of data and information and the existence of attention deficit disorder symptoms in advanced ICT users within the modern technological environment. The paper also suggests that there is a correlation between those two disorders. We propose that information is the primal object of the addiction and that ICT environment serves as a catalyst for massive information consumption. Survey was performed on advanced ICT users (employees in private and public ICT sector in field of database administration, software development, operations/maintenance management, network administration, ERP consultation, web development, graphical design and teaching information science) so the influence of modern information technology in this study is implicit.

3 Preceding observations about the excessive consumption of information

L. Grossman in his article "The Hyperconnected" provides an illustrative example of the behaviour patterns of the modern information technology users that show symptoms of "addicts caught in an epidemic" [14].

M. Richtel in the article "The Lure of Data: Is It Addictive?" describes a similar example where user of modern technology shows signs of addiction and the effects of performing multiple tasks simultaneously, and thus is unable to maintain attention to current activity; instead, attention is dispersed among the various activities which leads to lack of efficiency in task performing [24].

In the context of addiction, the question posed by the researchers is whether people are compulsively drawn to the constant stimulation provided by upcoming data, and whether the absorption of information causes a similar satisfaction as the one caused by consuming certain physical substances. J. Ratey, professor at Harvard, states that "it's like a dopamine squirt to be connected" [15], and he relates the feelings that are present in the information technology users, while they are connected to the information network, with the feelings which are result of the consumption of drugs - pleasure, stimulation and escape. He adds that individuals after disconnecting from such network can't function in the stillness without the information stimulation and causes development of the withdrawal symptoms.

Hallowell and Ratey [15] are studying ways that technology affects attention, creativity and focus. These authors consider whether the multitasking (term for a process when individual performs several jobs at once) is counterproductive and whether it is accompanied by addictive behaviours. They created the term "pseudo ADD" to describe this type of condition. Individuals who suffer from this kind of disorder do not suffer from clinically diagnosed attention deficit disorder, but under the influence of technology and modern life they develop significant symptoms of attention disorder. Such individuals become frustrated with long-term projects and on the specific way they depend on the continuous input of information, with excessive email or SMS messages checking, etc. This new kind of attention disorder is also described in Dr. Hallowell book [16].

Research conducted by Yoo H.J. et al. over 535 students in South Korea [28] showed a significant relationship between the level of symptoms of attention deficit hyperactivity symptoms and level of symptoms of Internet addiction. Measurement of Internet addiction was assessed by the Young's test of Internet addiction, while teachers and parents filled The DuPaul's attention deficit hyperactivity disorder rating scale (ARS; Korean version, K-ARS, which consists of 18 symptoms of attention disorders described in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders - DSM-IV; nine for attention deficit and nine for hyperactivity and impulsivity domains).

Another study conducted by Yen J.Y. and et al. over 2114 adolescents in Taiwan [27] showed a correlation between Internet addiction and symptoms of attention deficit and hyperactivity disorder. Measurement of Internet addiction was assessed

by Chen Internet Addiction Scale (CIAS), while measurement of attention disorders was assessed by Attention-Deficit/Hyperactivity Disorder Self-Rated Scale (ADHDS). The 18 items in the ADHDS were modified from the Vanderbilt ADHD diagnostic scale and reflected the 18 diagnostic symptoms of attention disorders described in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders.

4 The addiction concept

The addiction concept is used to describe persistent, compulsive dependence on a behaviour or substance [21]. The dependency on certain external stimuli causes a feeling of satisfaction and produces psychological impulse that requires occasionally or regularly taking the substance or repeating the action, in order to experience pleasure or to avoid discomfort. Psychological dependence has symptoms which demonstrate generally loss of control or obsessive and compulsive search for substance and continued use of it in spite of clearly opposed consequences, while the physical addiction is there when a physical body has need for a particular substance [21], [23].

At first, the dependence is defined solely in the context of drug consumption, eventually the number of researchers increased who studied the possibility that many behaviours which do not include a consumption of various substances, can be considered addictive. Such addictions include addiction to gambling, overeating, sex, exercise, addiction to computer games, the acquisition of wealth and etc [4], [10], [11], [12], [29]. These criteria will be implemented in the study through a questionnaire in the part of "the information addiction" to determine the existence of addictive behaviour.

In this context we also must mention the term technological addiction [9], [26]. It is defined as non chemical or behavioural addiction, which involves the interaction between man and machine. Such dependence [9], [11], [12], [26] can be either passive (e.g. watching television), or active (e.g. playing computer games) and usually contain features that contribute to the development of addictive preferences. Technological addictions can be seen as a subset of behavioural addictions [20] and they contain the core components of addiction, which was first defined by Brown [4], and modified by Griffiths [12], and they are:

- *salience* - refers to the prominence of certain activities in the life of the individual, his thoughts, feelings and behaviour. Even when an individual is not involved in the activity itself, it will project in the near future when he will again perform this activity.
- *mood modification* - refers to the subjective experiences that people perceive as a result of the execution of certain activities. For example, during the Internet activities can be developed feeling of "escape".
- *tolerance* - describes the process which requires increased amounts of certain activities in order to achieve the former effect. For example, a gambler has to gradually increase its stake to reach euphoria which was earlier reached with smaller stakes.
- *withdrawal symptoms* - are unpleasant emotional state and/or physical effects that occur when a particular activity is interrupted or suddenly reduced (e.g., shivering, moodiness, irritability, etc.).
- *conflict* - different types of conflict exist in addictive persons: interpersonal conflicts are conflicts between the addicts and other people; intrapsychic conflict are conflicts within the individuals themselves, which are manifested in the feeling of loss of control or concern for the time spent on the Internet. Conflicts occur between addicts and other daily activities (hobbies, work and social life).
- *relapse* - refers to the tendency to repeat earlier forms addictive behaviour after a certain period of abstinence or control.

According to the same author, any behaviour that meets the six criteria is defined as the addiction [12].

5 Attention-deficit disorder

Attention-deficit disorder (ADD) is a neurobehavioral disorder that occurs in 3-9% of children and

about 4% of adults [2], [8], [17], [25] According to DSM-IV [6], "Inattention may be manifest in academic, occupational, or social situations". Some of the characteristic behaviours and symptoms of individuals who are diagnosed with ADD include [6] "failing to give close attention to details or making careless mistakes in schoolwork or other tasks", "often difficulty with sustaining attention in tasks", "appearing as if their mind is elsewhere or as if they are not listening or did not hear what has just been said", "possible frequent shifts from one uncompleted activity to another", "difficulties with organizing tasks and activities", "easily distracted by irrelevant stimuli and frequently interrupt ongoing tasks to attend to trivial noises or events that are usually and easily ignored by others", "not listening to others, not keeping one's mind on conversations".

This paper will cover typical symptoms of attention disorders extracted from DSM-IV [6] and use them for the development of the on-line research questionnaire. Extracted categories of attention disorder symptoms include inattention, disorganization and forgetfulness.

5.1 Inattention

Individuals with ADD often have difficulty staying focused and attending to daily tasks. Their attention is easily drawn away from ongoing activities by irrelevant sights and sounds and they frequently shift from one activity to another (not completing any of them). It is difficult for them to follow a conversation and listen to others. They become bored quickly.

5.2 Disorganization and forgetfulness

Workplace or private accommodation of individuals with ADD is often messy and cluttered. They have difficulty organizing time and activities, prioritizing tasks or starting and finishing projects. Adults with ADD are often losing or misplacing things.

6 The research

6.1 The Research Problem

This paper investigates existence of addictive models of behaviour concerning the constant input of data and information in the modern ICT environment and the assumption that there is a correlation between such addictive models and symptoms of attention deficit disorder (ADD) in advanced ICT users.

6.2 Sample

A total of 100 advanced ICT users were recruited for the study. Male and female users were equally represented (age of respondents between 20 and 35 years). Recruits were employees in private and public ICT sector in field of database administration, software development, operations/maintenance management, network administration, ERP consultation, web development, graphical design and teaching information science. Biased sample approach based on respondents' job occupation was fully intentional because it is assumed that ICT professionals are more exposed to modern technologies and thus more susceptible to research targeted behaviours.

6.3 Methodology

Symptoms of information addiction and symptoms of attention deficit disorder were evaluated by the customized self-report questionnaire. Questionnaire consists of 35 self-rating descriptive statements on a five point Likert scale, which are ranged as follows: 5-completely true; 4-mostly true; 3-neither true nor false; 2-mostly false; 1-completely false. Descriptive statements derived from referenced symptoms of both disorders. On-line questionnaire technique has been used, and the questionnaire was available online for three days, during which 100 responses were collected. Questionnaire was then deactivated and the data was downloaded locally on the computer in MS Excel format. Data analysis was performed in SAS JMP and SPSS software.

6.4 Results

Results of the research are presented in the form of bar charts which show summed responses to self-report questionnaire. Response numbers are given in absolute values and percentages, which due to the nature of number of subjects correspond to the absolute values of the responses. For the purpose of

consistent reference, each question is marked with identification tag: ADDx for the group of statements related to symptoms of attention deficit disorders, and IAx for group of statements relating to symptoms of information addiction, where x is an in-group identification number.

6.4.1 Statements relating to symptoms of Attention Deficit Disorder

The results for the statement *"I often tend to switch activities (multitask) at the workplace, or in private life."* (ADD1), show that 81% of respondents correspond affirmatively: 49% responded completely true, 32% responded mostly true, 14% responded neither true nor false; 2% responded mostly false and 3% responded completely false. Frequent shifts from one activity to another are described as one of the possible symptoms of Attention Deficit Disorder.

Similarly, the responses to the statement *"My Internet browser has a lot of tabs open most of the time (some of which are often not needed at a time)."* (ADD2) show that most respondents show features of multitasking performance, disorganization and lack of focus when working with Internet browsers: 39% responded completely true, 25% responded mostly true, 10% responded neither true nor false, 16% responded mostly false and 10% responded completely false.

The statement *"I frequently shift from one unfinished activity to another."* (ADD3) directly relates to an ADD symptom. Nearly half of respondents responded affirmatively: 15% responded completely true, 29% responded mostly true, 34% responded neither true nor false, 16% responded mostly false and 6% responded completely false.

More than a third of respondents corresponded affirmatively: 11% responded completely true, 21% responded mostly true, 32% responded neither true nor false, 25% responded mostly false and 11% responded completely false, to the statement *"I'm relatively quickly bored with things."* (ADD4), which shows another sign of symptoms of attention deficit disorder.

19% responded completely true, 26% responded mostly true, 25% responded neither true nor false, 19% responded mostly false and 11% responded completely falsey to the statement *"Sometimes I postpone important work because I feel the need to search and browse for off-topic and mostly irrelevant information."* (ADD5), which is associated with the effects of distraction, multitasking and partially with the symptoms of addiction.

The statement *"Little things often drag away my attention from current activities."* (ADD6) directly shows one of the symptoms of attention disorder, and is responded affirmatively by 38% respondents: 15% responded completely true, 23% responded mostly true, 23% responded neither true nor false, 28% responded mostly false and 11% responded completely false.

For the statement *"It happens that I turn on the computer with a specific intent, activate web browser, and then stop, because I can't remember what to do next."* (ADD7) even one third of respondents responded affirmatively: 16% responded completely true, 14% responded mostly true, 16% responded neither true nor false, 27% responded mostly false and 27% responded completely false. A survey results on this statement demonstrates existence of significant attention disorder symptoms with using ICT.

Difficulty organizing working place and/or private residence is one of the symptoms of ADD. Results to the statement *"My working place and/or place of residence are often in mess"* (ADD8) demonstrate that 45% of respondents showed lack of organizational abilities in their surroundings: 22% responded completely true, 23% responded mostly true, 25% responded neither true nor false, 16% responded mostly false and 14% responded completely false.

More than a third of respondents believe that they have difficulties with dealing with long-term projects and jobs and they answered affirmatively to the statement *"Long-term jobs/projects are a big problem for me. I am impatient for results and for bringing a work towards end."* (ADD9): 15% responded completely true, 16% responded mostly true, 29% responded neither true nor false, 28% responded mostly false and 12% responded completely false.

The statement *"It is difficult for me to focus on others while they're talking, I often interrupt others while they are talking and answer the question until it is not completely asked."* (ADD10) is directly related to ADD, and affirmatively answered almost a third of respondents: 9% responded completely true, 17% responded mostly true, 11% responded

neither true nor false, 32% responded mostly false and 31% responded completely false.

6.4.2 Claims relating to elements of addiction

Responses to the statement, *"I too often look at the new e-mails and instant messages (ICQ, AIM, Gtalk etc.). Sometimes I'm clicking on 'refresh' to check if new email message has in the meanwhile arrived."* (IA1), shows that nearly half of respondents showed a tendency towards addictive behaviour to new information: 22% responded completely true, 23% responded mostly true, 23% responded neither true nor false, 17% responded mostly false and 15% responded completely false.

Responses to the statement *"To check new email, instant messages, short message service (SMS) or to read about the new themes for a moment, short while, relaxes me or calms me down."* (IA2) showed that 36% of respondents positively answered symptoms, feelings of comfort, calm, relaxation, caused by the consumption of substance: 8% responded completely true, 28% responded mostly true, 24% responded neither true nor false, 22% responded mostly false and 18% responded completely false.

Similar results can be seen in the following two statements, where the well-being occurs in 35% and 42% of patients, which is directly associated with the criterion of addiction that we have called mood modification [11], [13]. Replies to the statement *"I feel a certain comfort and relief while using a variety of Internet services (YouTube, LinkedIn, Facebook, instant messaging, email, etc.)."* (IA3) demonstrate that more than one third could be identified with this statement: 11% responded completely true, 24% responded mostly true, 25% responded neither true nor false, 22% responded mostly false and 18% responded completely false.

Responses to the statement *"I feel pleasure and/or enjoyment when you download certain information from the Internet."* (IA4) demonstrate that 42% of respondents have feelings of satisfaction when downloading certain information from the Internet: 20% responded completely true, 22% responded mostly true, 22% responded neither true nor false, 17% responded mostly false and 19% responded completely false.

Compulsive behaviour during input of new information, it is evident by the responses to the statement *"Periodically, I too often check the site with news, although the time period, is probably too short for displaying the new stories."* (IA5). On the one side, there is a normal curiosity about current events in the world that we can satisfy by the reading or watching the various forms of information transfer. However, this statement describes the *"too often"* checking the latest news and it was emphasized that the individual is aware that there is too little probability for the new stories to occur, in a time when he didn't follow them. The preference to check and unconsciously "hoping" for new information to occur can't be seen as rational behaviour. Almost half of respondents answered affirmatively to this statement: 22% responded completely true, 22% responded mostly true, 22% responded neither true nor false, 15% responded mostly false and 19% responded completely false.

The results for the statement *"From time to time I look for new sources of information (Internet, magazines, newspapers, ...), because I believe that the current, which I regularly visit, don't adequately meet my current needs."* (IA6) are directly associated with the criteria of addiction, which is called *"tolerance"*, where the quantity of substance addiction increases in order to achieve the same desired psychophysical effects, and 42% of respondents answered affirmatively: 6% responded completely true, 36% responded mostly true, 26% responded neither true nor false, 25% responded mostly false and 7% responded completely false.

Criteria of addiction that is called *"relapse"* is expressed by following statement *"Although, I sometimes conclude that I lost a lot of time on the consumption of unnecessary information, and for a certain period of time I do not that, but soon after that I return to the old unwanted patterns of behaviour."* (IA7), and this effect by itself identifies 37% of respondents: 15% responded completely true, 22% responded mostly true, 22% responded neither true nor false, 27% responded mostly false and 14% responded completely false.

The results for the statement *"I think in some way that I am dependent on the quest and consumption of information."* (IA8) directly encourages self-assessment of respondents about the dependence of the information (information addiction). 38% of respondents believe that in some way dependent on information: 9% responded completely true, 29% responded mostly true, 29% responded

neither true nor false, 20% responded mostly false and 13% responded completely false.

Responses to the statement *"I often use audio and/or video player while walking or driving."* (IA9) show that almost half of respondents use audio or video input information during activities in which input of information is not necessary, and may be potentially harmful: 22% responded completely true, 21% responded mostly true, 21% responded neither true nor false, 16% responded mostly false and 20% responded completely false.

Following five statements describe potentially addictive behaviour, because the information that individuals consume are not at the time required or the target of interest, and indeed it appears that the subjects who positively responded to those statements, is not clear why they seek such information. The results for the statement *"I often look at newsgroups and forums, and sometimes I read topics that usually not interest me."* (IA10) show that more than one third of respondents have this kind of habits: 9% responded completely true, 26% responded mostly true, 20% responded neither true nor false, 20% responded mostly false and 25% responded completely false.

Special attention should be paid to the statement *"I often search on the Internet about the subject that is unknown to me (and often irrelevant at that point), but I 'attach' to the subject until I learn more about it."* (IA11) because it shows the possibilities of computer technology in providing rapid information, and how it can be stated in this case serves as a catalyst of unnecessary input of information. Affirmatively has answered over half of respondents: 12% responded completely true, 46% responded mostly true, 16% responded neither true nor false, 20% responded mostly false and 6% responded completely false.

Computer technology as a catalyst of unnecessary input of information is present and at the answers to the following three claims. The results for the statement *"Often I download a lot of e-books, documentaries, variety of educational materials, which I normally don't manage to see."* (IA12) show that 42% of respondents answered affirmatively: 15% responded completely true, 27% responded mostly true, 19% responded neither true nor false, 15% responded mostly false and 24% responded completely false. They use the possibilities of connection to the Internet, not for a real need, but because of irrational impulses that can describe as the characteristics of addiction.

Preliminary conclusions can be transferred on the answers to the statement *"Very soon I fill the empty space on the hard drive with data which I for months can't manage to review."* (IA13), which show that more than one third of responedntd answerd affirmatively: 15% responded completely true, 20% responded mostly true, 19% responded neither true nor false, 23% responded mostly false and 23% responded completely false.

Also, the addictive characteristics are evident in the responses to the statement *"Sometimes I read extensively on the topics that are not in my domain, and I think that, for some unclear reasons, those information would be useful."* (IA14), where 38% of respondents said that without a goal (or with some uncertain purpose, which can be attributed to a particular kind of attention) enters the new, unknown until now, information: 10% responded completely true, 28% responded mostly true, 18% responded neither true nor false, 24% responded mostly false and 20% responded completely false.

Answers to the following two statements can be considered as some extent positive in the context of behaviour of the users of computer technology. The results for the statement *"I use a variety of tutorials found on the Internet for the purpose of learning areas or activities that are not my domain."* (IA15) show that more than one third of responednts answerd affirmatively: 16% responded completely true, 18% responded mostly true, 21% responded neither true nor false, 27% responded mostly false and 18% responded completely false.

Responses to the statement *"The materials found on the Internet interested me to learn new areas or activities that I would otherwise not learn."* (IA16) show that more than one half of respondents agrees with this claim: 20% responded completely true, 32% responded mostly true, 28% responded neither true nor false, 13% responded mostly false and 7% responded completely false.

More than half of respondents answered affirmatively to the statement, *"While on holiday and without computer technology, I feel that I lack the scope of information provided by modern technologies."* (IA17): 17% responded completely true, 35% responded mostly true, 12% responded neither true nor false, 16% responded mostly false and 20% responded completely false.

Criteria of addiction, which is called the *"salience"*, can be shown to some extent by statement *"I often notice that I think about seeking some information while I do not have Internet access."* (IA18), on which affirmatively respond the nearly half of respondents: 13% responded completely true, 33% responded mostly true, 16% responded neither true nor false, 21% responded mostly false and 17% responded completely false.

Finally, in response to the statement *"I rarely spend time with turned off the computer/mobile phone/TV/audio-video player gadgets."* (IA19), we can see that 59% of respondents can't work without a computer, or information that it offers them: 30% responded completely true, 29% responded mostly true, 16% responded neither true nor false, 19% responded mostly false and 6% responded completely false.

Other statements that were in the research questionnaire: *"I am feeling nervous, anxious and irritable far more than I think I should be, considering the current situation."* (ADD11); *"I have noticed that after a prolonged periods of working with computers I have difficulties remembering some words or phrases in direct communication with another people."* (ADD12), *"After prolonged periods of using information technology I feel anxiety, hyperactivity, and my focus is significantly reduced."* (ADD13), *"Before I make a purchase of some item, I tend to "optimize" that purchase by a comprehensive analysis of reviews of the selected item on various Internet sites."* (IA20), *"I often blame myself because I feel that I spent too much time on the activities of the information consumption at the expense of others, objectively more important activities."* (IA21), *"Amount of web pages saved in my browser bookmarks grows daily. I often save a website in bookmarks and never look at it again."* (IA22).

Reliability of the information addiction symptoms scale is determined by the method of internal consistency and the results show that it is a scale of good reliability. Reliability for the entire scale of 22 particles is Cronbach alpha 0.89. Reliability of the ADD symptoms scale is also determined by internal consistency and the results show that it is a scale of good reliability. Reliability for the entire scale of 13 particles is Cronbach alpha 0.814.

Correlation is a measure of association of responses to one variable with the responses of the same subjects in the other variable. We calculated correlation between the average results from the group of questions related to the information addiction symptoms and the average responses for the group of questions related to ADD symptoms. The correlation coefficient is 0.59 with acceptable probability of $p<0.0001$. Correlation between individual particles was also performed. Selected results are presented in Table 1.

7 Conclusion

This paper investigated the existence of addictive models of behaviour concerning the constant input of data and information and the existence of attention deficit disorder symptoms in advanced ICT users within the modern technological environment. The paper also suggested that there is a correlation between those two disorders. Presented results of the research demonstrate significant evidence of attention deficit disorder symptoms and technological (information/Internet) addiction symptoms existence in advanced ICT users. Findings of this study also indicate significant correlations between these two groups of symptoms. This study differs from related previous studies [27], [28] in two main aspects; first, we have studied advanced, adult ICT users; second, we focused on broader concept than Internet/technological addiction, which we called *information addiction*. We proposed that information is the primal object of the addiction and that ICT environment serves as a catalyst for massive information consumption.

Limitations of this study include: (i) online questionnaire was based on the self-assessment scale which could reduce its objectivity; (ii) diagnosis of information addiction needs to be refined with standardized diagnostic tools to improve the reliability and validity; (iii) relationship between technological, Internet, and information addiction needs further in-depth psychological analysis; (iv) there is no control population which confirms the role of technology as a key factor that catalyzes the listed behaviours.

In conclusion, the results of this study show a specific relationship between attention deficit disorder and information addiction symptoms and support the need for further research in information addiction as a risk factor for the development of

Table 1: Selected results of the Pearson correlation between variables

	ADD2	ADD3	ADD4	ADD5	ADD6	ADD7	ADD9	ADD10	ADD11	ADD12
IA1	0,248*	0,073	0,069	0,172	0,073	0,114	0,067	0,071	0,348**	0,143
IA2	0,102	0,262**	0,101	0,162	0,433**	0,138	0,232*	0,263**	0,300**	0,242*6
IA4	0,214*	0,163	0,138	0,314**	0,298**	0,281**	0,259**	0,240*	0,253*	0,201*
IA5	0,16	0,369**	0,340**	0,426**	0,385**	0,288**	0,275**	0,116	0,318**	0,309**
IA6	0,095	0,183	0,248*	0,186	0,172	0,201*	0,211*	0,389**	0,259**	0,099
IA7	0,258**	0,334**	0,215*	0,479**	0,395**	0,434**	0,309**	0,172	0,300**	0,403**
IA8	0,205*	0,318**	0,266**	0,350**	0,384**	0,394**	0,320**	0,250*	0,271**	0,375**
IA10	0,149	0,222*	0,196*	0,311**	0,399**	0,159	0,187	0,067	0,121	0,112
IA11	0,244*	0,125	0,144	0,144	0,18	0,319**	0,207*	0,241*	0,076	0,197*
IA13	0,322**	0,178	0,164	0,408**	0,317**	0,211*	0,193	0,07	0,082	0,171
IA14	0,082	0,105	0,115	0,296**	0,213*	0,224*	0,144	0,312**	0,258**	0,303**
IA15	0,300**	0,082	0,074	0,171	0,134	0,208*	0,086	0,279**	0,047	0,13
IA16	0,218*	0,112	0,081	0,314**	0,005	0,225*	0,061	0,069	-0,035	0,225*
IA17	0,166	0,254*	0,089	0,270**	0,324**	0,279**	0,363**	0,203*	0,276**	0,173
IA18	0,16	0,269**	0,375**	0,433**	0,359**	0,307**	0,396**	0,284**	0,218*	0,178
IA19	0,276**	0,349**	0,304**	0,501**	0,455**	0,136	0,364**	0,116	0,187	0,310**
IA20	0,283**	0,134	0,13	0,218*	0,319**	0,221*	0,138	0,005	-0,14	0,003
IA21	0,212*	0,178	0,116	0,497**	0,304**	0,302**	0,256**	0,117	0,284**	0,181
IA22	0,375**	0,331**	0,144	0,164	0,282**	0,379**	0,223*	0,272**	0,163	0,268**

** Correlation is significant at the 0.01 level; * Correlation is significant at the 0.05 level

ADD symptoms. Subsequent studies may further investigate the origin of information addiction and its relationship to ADD symptoms.

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