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CHARACTERISTICS, PROTECTIVE AND RISK FACTORS OF PROBLEMATIC INTERNET, SMARTPHONE AND SOCIAL MEDIA USE AMONG YOUTH

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INTRODUCTION

The rapid technological development of the last few decades has fundamentally changed the lives of new generations. With the spread of the Internet, boundaries known so far such as distance or time, have finally disappeared; the need for immediate access to information and being online have unquestionably integrated into the daily lives of our society. The increasingly accepted and so-called 'digital lifestyle' affects the most today's teens, therefore, the most crucial thing in their case is to examine the effects of the Internet as a communication channel and the use of smartphones as one of the main means of accessing Internet. In addition, we cannot ignore social media sites that have central role, and affect many areas of our lives directly and indirectly.

Literature on problem behaviors related to the Internet dates back nearly 30 years (Young, 1996), while smartphones can be found in the context of problem behaviors for about a decade and a half (Bianchi and Phillips, 2005). The emergence of addictive behavioral patterns associated with social media can also be dated to the mid-2000s (Kuss and Griffiths, 2011). Among the predisposing factors, we can highlight several psychological factors that act partly as a risk factor or as a protective factor. The latter are also important because they can play a role in prevention. Furthermore, we can read more and more publications about the decrease in the prevalence of smoking among young people, which can be both positive and alarming from the point of view of behavioral addictions. Given that we can find motives for problem use in younger generations as well, it seems clear that school plays a vital role in influencing device use of adolescents.

Based on these, this dissertation aims to present the results of our three projects on problematic Internet, smartphone and social media use, which identify risk and protective factors, specify different user profiles, reveal factors influencing problematic use and explore its connection with smoking. By presenting our results, we hope to get a comprehensive and more accurate picture about the risk and protective factors of problematic use, and to better understand the motivation of Hungarian young people on device usage. Thus, these may bring us closer to promote conscious and purposeful use.

THEORETICAL BACKGROUND

Adolescents, Internet and digital natives

In the last century, processes of modernization have brought changes that have fundamentally reshaped the structure of society and intergenerational relations. In particular, young generations' life has been affected by these processes and such phenomena have gained ground that have radically changed their development in several aspect. These can affect the psychosocial crisis points of adolescence (e.g., need for peer relationships, future planning) and may interact with different neurodevelopmental characteristics (cortical volume depletion, massive development of subcortical regions, increased amygdala activity [Jaworska and MacQueen, 2015]) to increase the risk of certain risk behavior in the context of adolescent problem behavior syndrome (Jessor, 1993).

Because of the almost unlimited use of the World Wide Web, the essential role of newer media in shaping our society is one of the most exciting and researched topics within the framework of social science (Verboord and Janssen, 2015). "New media are transforming society through new cultures. This process has accelerated so much that it is now happening on a daily basis; people can start a new life through communication and the media" – we cite Howard Rheingold

(Krekovic, 2003). Among Internet access methods, smartphones clearly stand out by providing a permanent online presence and the following features: convenient, fast, limitless, informative and fun. We can hardly say anything new about the central role of social media in our lives, as online social media sites have become essential platforms for information flow, communication, and self-expression. This is especially true for the adolescent age group.

The last members of generation Y (1980-1995) and major part of generation Z (1995-2010) are already digital natives: online space is a defining element of their lives. ICT[1]tools have almost become part of their being: they are in their homes, education, and social relationships. We cannot say much about the members of the generation alpha (2010-2024) – we can observe that ICT tools have been with them since birth (McCrindle and Fell, 2020). However, with the virtual world, not only comfort and immediacy have emerged in the lives of young generations. Terms that have become part of the common language refer to and draw attention to the harmful aspects of the usage of Internet and various smart devices; these terms are *nomophobia, FoMo, FoBo, smombie, cyberhate, sharenting, ringxiety*, and so on.

Behavioral addictions

In the recent years, addiction as a collective term has spread beyond the interpretation of chemical addictions to non-chemical-related disorders. Behavioral addiction can be considered as a form of behavior, which can occur normally in everyday life, but begins to dominate the person's life, and this process has detrimental consequences for his or her lifestyle, physical and mental health, and environment. The emergence and course of behavioral disorders associated with the Internet and online space have been associated with chemical addictions by most researchers (Young, 1996). Studies show that due to high interactions and common psychological background mechanisms, behavioral addictions have a very similar neurobiological background to chemical dependencies (Potenza, 2008).

Improper use of both the Internet itself and smartphones or social media manifests in a certain form of behavior that has distinctive components. These components are built into a specific structure along a model. These include the obsessive-compulsive spectrum hypothesis, the reward deficiency syndrome hypothesis, the "components" model of behavioral addictions developed by Griffiths, and the cognitive-behavioral model, which all may provide an explanation for the etiology of behavioral addictions. Griffiths (1998) was the first who synthesized behavioral disorders described by Hollander as obsessive-compulsive and impulsive by Blum as behavioral addictions. Griffiths identified six main characteristic symptoms of behavioral addictions based on the literature available so far: salience, mood regulation, tolerance, withdrawal symptoms, conflict, and relapse (Demetrovics, 2013).

Problematic Internet Use (PIU)

Since there is no clear evidence that mentioning Internet-related problem behavior as an addiction is correct, we use the term problematic Internet use in our research, which is also considered appropriate in the Hungarian literature (Demetrovics, 2004). Its use is supported by the fact that it includes both problematic Internet use and other pathological conditions that result from it: "...*problematic users lose control of their Internet use, immerse in Internet use, and become unable to reduce the time they spend using the Internet, even though it causes them problems.*" (Koronczai [2010] cites Young). The American Psychiatric Association's 2013 diagnostic recommendations for Internet gambling disorder may also provide a good starting point for defining problematic Internet use (Schivinski et al., 2018). Based on these

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[1] Information and communication technology

recommendations, at least five of the following nine criteria must be met for at least 12 months to identify problematic Internet use:

- Preoccupation with using the Internet (preoccupation)
- Withdrawal symptoms when Internet is taken away or not possible (withdrawal)
- The need to spend more time with the Internet to satisfy the urge (tolerance)
- Inability to reduce Internet time (lack of control)
- Giving up other activities, loss of interest in previously enjoyed activities due to Internet use (neglect)
- Excessive Internet use despite psychosocial problems (sustainment)
- Deceiving family members or others about the amount of time spent on the Internet (deception)
- The use of Internet to relieve negative moods, such as guilt or hopelessness (guilt)
- Risk, having jeopardized or lost a job or relationship due to Internet use (negative consequences)

In terms of types, the publication of Young, Pistner, O'Mara, and Buchanan (1999) can be considered authoritative, mentioning five main subtypes depending on the content visited: *cybersexual addiction; cyberrelationship addiction; excessive use of chat rooms; net compulsions; compulsive web surfing; addiction to interactive computer games.* Extreme prevalence data can be found in the literature due to the fact that these studies were conducted with different measurement tools and in different age groups (Moreno, Jelenchick, and Christakis, 2013). In most cases, Hungarian research determines the prevalence in 4 to 10% (Prievara, 2018). The consequences of problematic use are usually listed according to five distinct aspects: consequences related to school, school performance (Derbyshire et al., 2013); consequences related to human relationships; financial consequences (Chaudhari et al., 2015); employment consequences (Shrivastava, Sharma and Marimuthi, 2018); and consequences related to health status (Mok et al., 2014).

Problematic Smartphone Use (PSU)

The raison d'être of problematic smartphone use as a separate behavioral addiction is still a controversial issue (Panova and Carbonell, 2018). Many people believe PSU is inseparable from problematic Internet use, as the very essence of a smartphone is to provide a continuous Internet connection available from anywhere and many benefits, such as online entertainment, keeping in touch, searching for information. However, there may be differences among the risk and protective associations between the two phenomena (Choi et al., 2015). According to the research of Walsh, White and Young (2010), PSU can be divided into three types according to the nature of use: *risky use, misuse, and overuse.* Data from a 2019 meta-analysis resulted in a prevalence of 23.3%, so one in four adolescents was a problem user according to this study (Sohn et al., 2019). Based on this, the authors described PSU as a public health problem, of which prevention tools harm reduction strategies were highlighted. Until the completion of this dissertation, we did not find prevalence data in Hungary except our own data; we can only read publications about the features and frequency of use according to age groups (Csibi et al., 2019). Furthermore, addictions, whether of a behavioral or chemical nature, tend to accumulate (Lee et al., 2013). Smoking, for example, has been researched several times in relation to problematic use of digital spaces, with diverse results (El Asam, Samara, and Terry, 2019; Prievara and Pikó, 2015).

Problematic Social Media Use (PSMU)

The question may arise: can we talk about problematic smartphone and Internet use independently, or about problematic social media use? Is it really Internet activity that is responsible for other addictions as well? These online social spaces play an especially important role in the life of adolescents, as they fully serve their special needs arising from their age-related characteristics. In addition to these, sense of security, self-realization and self-expression are also ensured, and adolescents can receive feedback that is essential for his or her self-esteem. Therefore, researches are beginning to examine different applications; their prevalence, their role in the lives of young people and their correlations with psychological characteristics (Montag et al., 2015). Examining Hungarian adolescents, Bányai and her colleagues (2017) found that 4.5% of their sample was considered risky in terms of problematic social media use.

Psychological variables and problematic use

Due to common neurobiology, strong correlations and similar psychological background mechanism described in connection with the three mentioned phenomena, we can assume that the psychological factors are roughly the same in these problem behaviors. Among the risk factors, research has shown that *boredom* has a very significant effect on the development of problematic use (Ulicza et al., 2015), and the *sensation seeking* is also related to problematic use, which ensures the level of stimuli needed to escape boredom (Rahmani and Lavasani, 2011). However, research has also confirmed that *flow* is also significantly associated with the feelings of satisfaction triggered by smartphone use (Park and Lee, 2015). *Social support* should also be noted in this list, as literature suggests that young people with subjectively lower social support become estranged from their acquaintances and families, thus they tend to overuse the opportunities offered by the Internet to achieve safety and satisfaction (Zhang et al., 2018). *Self-esteem* has also been described as a significant protective factor (Kim and Davis, 2009), but the most important protective factor is *self-control*: self-control shows the most obvious and powerful bidirectional relationship, that is low self-control increases Internet use, while this activity pushes self-control towards the negative direction. Finally, *resilience* may also provide protection against the appearance of addictions (Robertson, Yan, and Rapoza, 2018).

AIMS AND RELEVANCE OF THE RESEARCH

Our research had four main goals; we structured our research questions and hypotheses around these goals. On the one hand, we wanted to get to know the most important characteristics of Hungarian young people's online activity, such as how much time they spend online. We were curious whether sociodemographic variables play any role in problematic use, and if so, in what direction. Our second research goal was to explore the psychological factors influencing problematic use, thus we wanted to find the protective and risk factors of problematic use in the light of the literature. For this purpose, we examined the possible role of self-esteem, self-control, resilience, sensation seeking, social support, boredom proneness, and flow in problematic use. The third goal was to find out the main characteristics of young people's social media use; what applications they use most often, for what purpose they use the various social media platforms the most, and whether they use any online dating application. As our last and fourth goal, we sought to explore the relationship between problematic use and smoking, anticipating the assumption that smoking may be replaced by smartphone use because of its manual nature.

QUESTIONS AND HYPOTHESES OF THE RESEARCH

We organized our research questions into four groups according to our previously described objectives.

> I.   *General questions and related hypotheses about problematic use:*

− Do the examined sociodemographic variables play a role in promoting problematic use? Is there a gender or age difference in the frequency of online activity?
− How much time do young people spend online on an average weekday and weekend? Is there a correlation between time spent online and the development of problematic use?
− How can we describe the different groups of Hungarian teenagers and young adults participating in the study in terms of the risk of problematic use and the examined psychological factors? Who are in the greatest danger in terms of problematic use?
− Has the level of problematic Internet and smartphone use changed compared to previous years?
    H_1: We assume that there is no gender difference in problematic use (Parker et al., 2008; Haug et al., 2015).
    H_2: We assume that family structure, subjectively assessed financial situation, type of residence, and one's own education are not related to the development of problematic use (Xin et al., 2018).
    H_3: We assume that the lower the age, the more prone to problem use (van Deursen et al., 2015; Nakayama et al, 2020).
    H_4: We assume that men spend more time online (Dufour et al., 2016).
    H_5: We assume that the time spent online is related to problematic use (Tonioni et al., 2011).
    H_6: We assume that the prevalence of problematic Internet and smartphone use has increased compared to previous years (Cash et al., 2012; Sohn et al., 2019).

> II.   *Questions and related hypotheses about the role of psychological variables (self-control, resilience, social support, self-esteem, boredom proneness, sensation seeking, flow) in problematic use:*

- Do an adequate level of self-control and a higher level of resilience protect young people from the development of problematic use?
- Can low self-esteem, boredom, sensation seeking, and desire for flow lead to excessive use of the Internet and smartphones?
- What are the factors that have the greatest impact on the development of problematic Internet and smartphone use?

  H_7: We assume that higher levels of self-control and resilience can be identified as protective factors in problematic use(Geng et al., 2018; Robertson, Yan and Rapoza, 2018).

  H_8: We assume that a lower degree of self-esteem is present as a risk factor in the development of problematic use (Kim and Davis, 2009).

  H_9: We assume that higher values of boredom, sensation seeking, and flow are risk factors in the development of problematic use (Chou, Chang and Yen, 2018; Wang et al., 2018b; Park and Lee, 2015).

III. Questions and related hypotheses about problematic social media use:

- Do we find a difference between the two genders in terms of the most popular online activities?
- What are the differences between genders on the most popular social networking sites? Which social media features are the most commonly used by young people?
- Do young people use online dating applications, and if so, which ones?
- What is the relationship between problematic social media and smartphone use?

  H_{10}: We assume we find gender differences in terms of activities doing on the Internet and on smartphones. According to this, men are characterized by the use of multimedia content and games, while frequent visits to social media platforms are more common among women (Ang, 2017).

  H_{11}: We assume that young people use social networking sites more for messaging than for content sharing, expression, or gaming, making Facebook and the related Messenger the most popular social media applications among young people participating in our study (Song et al,, 2004; Duke and Montag, 2017).

IV. Questions and related hypotheses about smoking and its relationship to problematic use:

- Do smoking habits differ between age and gender groups?
- Is there a difference in motivations to smoke between age groups, genders, or different smoking statuses?
- Is there a link between smoking and problematic smartphone use? What are the main characteristics of groups formed by cluster analysis? Who are in the greatest danger in terms of the examined two phenomena?

  H_{12}: We assume that there is no difference in either lifetime or three-month prevalence values of smoking by gender (Sanchez et al., 2010).

  H_{13}: We assume that there are differences between age groups in terms of motivational subscales (attitude scales) for smoking (Khang, Kim and Kim, 2013; Chen et al., 2017).

  H_{14}: We assume that smartphone use will replace smoking as a pattern of unhealthy behavior in younger age groups ((Pikó et al., 2015; Odgers, 2018; Miech et al., 2020).

SAMPLE AND METHOD OF THE EMPIRICAL RESEARCHES

In our empirical research, three studies separated in space and time were conducted. All three researches were sampled online, which method was particularly justified by the topic of our study, and the literature also supports that younger generations have a high preference for online data collection because of its easy availability and simplicity (Ward, Clark, and Zabriskie, 2014). In all three studies, we used an online survey creator platform developed by Typeform™. The questionnaire pack was entirely voluntary and anonymous in nature, and we did not ask respondents for any data that could have provided identification in any way. Our research presented in this dissertation was carried out in the frame of a research project assessing the problematic use of the Internet, smartphones and social media among young people in secondary and higher education, with the ethical permission of the Doctoral School of Education, University of Szeged.

In the sample of our first project, there were young people aged 14 to 28 of Hungarian citizenship. A total of 249 people participated in the study, 155 women (62.2%) and 94 men (37.8%). As expected, most respondents belonged to the upper age group, and according to our data, 25-year-old people completed the questionnaire in the largest portion (N = 30; 12.0%), mean age of the sample was 22.5 years, and the standard deviation of the sample was 3.5.

The sample of our second study included young people of Hungarian citizenship between the ages of 14 and 30. Data from a total of 244 individuals were recorded, of which 161 were female (66.0%) and 83 were male (34.0%). The majority of respondents was 23 years old (N = 44; 18.0%), with a mean age of 23.1 years, while the standard deviation was 3.4.

The sample of our third cross-sectional study included young people of Hungarian citizenship between the ages of 16 and 30 (as the most affected age group). A total of 295 people participated in our study, of which 173 were women (58.6%) and 122 were men (41.4%). Most of them were 17 years old (N = 42; 14.2%), the mean age of the respondents was 22.6 years, and the standard deviation was 3.9.

The main parameters of the research – such as the method and time of data collection, applied measuring instruments, age range, sample size, and related publications – are all summarized in *Table 1* below.

Note: The table only includes references to the original scales in order to increase transparency.

Table 1 *List and main characteristics of measuring instruments presented in the dissertation.*

Project number	Project title	Year and method of data collection	Examined phenomena	Name of applied instruments	Number of participants	Examined age range	Related publications
I.	Correlations of problematic Internet and smartphone use with psychological variables	2017 online	Internet usage smartphone usage psychological variables: resilience, sensation seeking, self-esteem, social support, flow, boredom-proneness, self-control	Problematic Internet Use Questionnaire (Demetrovics, 2004)	249	14–28	Kiss and Pikó, 2018a; 2018b; 2018c; 2018d; 2019a; 2019b; 2019c; 2019e; 2019f; 2020a; 2020c
				Smartphone Addiction Inventory (SPAI) (Lin et al, 2014)			
				10-item Connor-Davidson Resilience Scale (CD-RISC) (Campbell-Sills and Stein, 2007)			
				Brief Sensation Seeking Scale (BSSS-8) (Hoyle et al., 2002)			
				Rosenberg Self-Esteem Scale (RSES-H) (Rosenberg, 1965)			
				Flow State Questionnaire (Magyaródi et al., 2013)			
				Boredom Proneness Scale (BPS) (Farmer and Sundberg, 1986)			
				Self-regulation Scale (Luszczynska et al., 2004)			
				Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988)			
II.	Characteristics of problematic smartphone and social media use	2018 online	smartphone usage social media usage	Smartphone Addiction Scale Short Version (SAS-SV) (Kwon et al, 2013)	244	14–30	Kiss and Pikó, 2019b; 2019d Pikó and Kiss, 2019a
				Bergen Social Media Addiction Scale (BSMAS) (Andreassen et al, 2012)			
III.	Relationship between problematic smartphone use and smoking	2019 online and paper-pencil	smartphone usage smoking habits	Smartphone Addiction Scale Short Version (SAS-SV) (Kwon et al, 2013)	295	16–30	Kiss and Pikó, 2019g; 2020b Pikó and Kiss, 2019b
				Substance Use Coping Inventory (Wills et al, 1999)			

MAIN RESULTS OF THE EMPIRICAL RESEARCH AND THEIR DISCUSSION

Cluster analyzes based on sociodemographic indicators and psychological characteristics of young people, as well as the analysis of the bilateral relationships of the examined phenomena, showed that the individual groups do not differ according to gender (H_1). This has refuted previous beliefs that Internet use is more popular among men and smartphone use is more popular among women (Choi et al., 2015). Knowing the characteristics of the four groups explored by the cluster analysis carried out in the first project, we can conclude that the clusters did not reveal any differences in social status indicators, which reflects the universal spread of the Internet and smartphones (H_2). This statement is supported by the results of the bilateral relations of the third project and refutes the results of previous research (Kayri and Günüc, 2016). Our age-related hypothesis (H_3) was unquestionably confirmed, i.e., younger generations were more involved in problematic use. This can be explained primarily by their age characteristics, the growing expansion of technology, and the radical transformation of our lifestyle. Regarding the time spent online, we can say that young people spend more time online than in previous years, and the time spent with actual online activity has also increased; however, the assumption that men spend more time online has not been proven (H_4). As a result of the multivariate regression of factors influencing problematic use and of the factor analysis, our hypothesis proved to be true (H_5): online activity and availability were also important predictors in our studies. The results of factor analysis also support this, in which time use and time management are cardinal factors in the development of problematic use. The prevalence of PIU was lower (6%) than described in previous Hungarian publications (H_6) (Prievara, 2018). Regarding the prevalence of PIU (4% – I. project [SPAI]; 2.5% – II. project [SAS]), in the absence of previous research in Hungary, we could not make any comparison. In an international comparison, we found much lower prevalence than, for example, in the countries of the Asian continent.

Self-control (Kim et al., 2018) and resilience (Nam et al., 2018), described by the literature as strong protective factors, also played a decisive role in our research (H_7). Self-control shows significant negative correlations with both problematic Internet and smartphone use; however, resilience proved to be a real protective factor only in relation to PIU. Our hypothesis (H_8) regarding self-esteem as a previously identified protective factor (Kim and Davis, 2009) proved to be partially true: its low level strongly predicts PIU based on logistic regression, but we cannot say the same for PSU: we found significant association only with certain sub-factors – negative with mood disorders and time use, and positive with compulsive use. The certainty of our next hypothesis (H_9) was also supported by the study of bilateral relationships and by regression analysis: higher values of boredom proneness, sensation seeking, and flow are significantly and positively related to problematic Internet and smartphone use. The most dominant factor was boredom proneness, which can be explained by the avoidance of relatively poor level of stimulation and the desire for constant feedback, the phenomenon of "hungry for reward".

Based on the results of the literature, different user profiles characterize the two genders (Chongyang et al., 2017). This is also supported by our own data (H_{10}): we found differences in the most popular social media applications and activities. Consistent with the motivations for using Internet and smart devices (described earlier), women engage in Internet and smartphone use primarily for intrinsic reasons, whereas men use them for extrinsic motivations. Based on our data, messaging feature proved to be by far the most popular function based on the opinion of young people; Facebook and Messenger are the most popular applications for this reason. The overriding priority of instant messaging function and the cardinal importance of communication during adolescence can explain the correctness of our assumption (H_{11}).

Based on the frequency data, our hypothesis (H_{12}) can be considered correct, as there was no significant difference between the two genders in the lifetime and three-month prevalence rates of smoking. Cigarette has been tried almost in the same ratio by both women (69.4%) and men (68%), while prevalence rates over the past three months are similar. Different factors are the drivers of smoking in each age group: while smoking appears to be most driven by emotional coping in younger smokers, who are more prone to problem use as well, social motivation is the most important factor in older people (H_{13}). In terms of smoking status, prevalence rates, and different motivations, we can conclude that the integration of smartphones into everyday life fundamentally changes the attitudes of young people towards destructive behaviors. As a result, smoking is increasingly being replaced and pushed into the background by addictive behavior problems associated with the Internet, smartphones, and social media (H_{14}).

Table 2 Hypotheses of the empirical researches.

	Hypothesis	**Evaluation**
H_1	We assume that there is no gender difference in the development of problematic use.	True
H_2	We assume that the family structure, the subjectively assessed financial situation, the type of residence, and the level of education are not related to the development of problematic use.	True
H_3	We assume that the lower the age, the more prone the individual is to problematic use.	True
H_4	We assume that men spend more time online.	Partly true
H_5	We assume that the time spent online (online activity and online availability) is related to the problematic use.	True
H_6	We assume that the prevalence of problematic Internet and smartphone use has increased compared to previous years.	False
H_7	We assume that higher levels of self-control and resilience can be identified as protective factors in problematic use.	Partly true
H_8	We assume that lower value of self-esteem could be a risk factor in the development of problematic use.	Partly true
H_9	We assume that higher values of boredom, sensation seeking, and flow are risk factors in the development of problematic use.	True
H_{10}	We assume that we find differences between the two genders in terms of activities on the Internet and on smartphones. According to this, men are characterized by the use of multimedia content and games, while women are frequent visitors of social media platforms.	True
H_{11}	We assume that young people use social networking sites more for messaging than for content sharing or gaming, making Facebook and its organically connected Messenger application the most popular social media applications.	True
H_{12}	We assume that there is no difference in either the lifetime or three-month prevalence values of smoking by gender.	True
H_{13}	We assume that there are differences between age groups in terms of motivational subscales (attitudes scales) for smoking.	True
H_{14}	We assume that smartphone use will replace smoking as a pattern of unhealthy behavior in younger age groups.	True

SUMMARY

Our results support the observation that smart devices and the Internet are used at increasingly young age, which implies the need to provide young people with information as early as possible, so they can use the World Wide Web and various smart devices consciously and safely. Taking into account the psychological characteristics represented by the clusters described in our research, we consider it expedient to develop targeted prevention programs by developing multi-component strategies in order to reduce problematic use. The development of self-control and resilience is central, but effective coping strategies highlighting the ways of emotional coping, are also key points. Our data may also be useful for further analysis as well as for planning school prevention programs. Another important finding is that motivational attitudes can play a significant differentiating role in the relationship between smoking and problematic smartphone use among 15 to 30-year-olds. We can also confirm that problematic use of the Internet, smartphones and social media are difficult to separate, but it is important to study them separately, as the knowledge gained in this way can bring us closer to identifying the characteristics of the most addictive applications. Although prevalence data did not prove to be too high in our researches, it is necessary to keep in mind that psychological problems related to PSU and social media platforms (Snapchat dysmorphia, online harassment, anxiety) are a growing public health problem beyond doubt (Sohn et al., 2019).

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