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






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PROBLEMATIC INTERNET ACTIVITIES AMONG UKRAINIAN ADOLESCENTS: GENDER AND PSYCHOSOCIAL DIFFERENCES

PROBLEMOWE AKTYWNOŚCI INTERNETOWE WŚRÓD UKRAIŃSKIEJ MŁODZIEŻY: RÓŻNICE ZE WZGLĘDU NA PŁEĆ I CZYNNIKI PSYCHOSPOŁECZNE

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Professor Svitlana Shchudlo, our co-author, passed away on 27th September 2022. At the time, she was a leader of the Drohobych research team.

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Abstract

Introduction: The aim was to analyse Ukrainian adolescents' (14 to 15 year of age) internet activity including the prevalence of normative and problematic activities and identification of teenage e-users profiles. Gender and psychosocial variable differences were also analysed.

Material and methods: The study was conducted in 2020 on Ukrainian adolescents aged 14 to 15 living in Lviv ($n = 1085$), Drohobych ($n = 499$) and surrounding rural area ($n = 454$). Due to pandemic

Streszczenie

Wprowadzenie: Celem badania była analiza aktywności internetowej ukraińskich nastolatków (14–15 lat), w tym częstości występowania normatywnych i problemowych aktywności internetowych oraz identyfikacja profili nastoletnich e-użytkowników. Analizowano również różnice ze względu na płeć i zmienne psychospołeczne.

Materiał i metody: Badanie zostało przeprowadzone w 2020 r. wśród ukraińskich nastolatków w wieku 14–15 lat mieszkających we Lwowie ($n = 1085$),

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Authors' contribution/Wkład pracy autorów: **Study design/Koncepcja badania:** K. Ostaszewski, M. Klimanska, L. Klymanska, S. Shchudlo, H. Herasym, V. Savka; **Data collection/Zebranie danych:** S. Shchudlo, I. Mirchuk, O. Zelena, H. Herasym; **Statistical analysis/Analiza statystyczna:** M. Klimanska, I. Haletska; **Data interpretation/Interpretacja danych:** K. Ostaszewski, I. Mirchuk, O. Zelena, L. Klymanska, V. Savka, M. Klimanska, I. Haletska; **Acceptance of final manuscript version/Akceptacja ostatecznej wersji pracy:** K. Ostaszewski, I. Mirchuk, O. Zelena, L. Klymanska, H. Herasym, V. Savka, M. Klimanska, I. Haletska; **Literature search/Przygotowanie literatury:** I. Mirchuk, O. Zelena, L. Klymanska, H. Herasym, M. Klimanska, I. Haletska; **Funds collection/Pozyskanie środków (finansowania):** K. Ostaszewski, S. Shchudlo

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restrictions, an online questionnaire was used in Lviv while a traditional questionnaire was circulated in Drohobych and the countryside. The source of methodology was the Polish Mokotów Study.

Results: Teenagers spend the most of their time online on social media followed by watching videos, communicating via messaging and playing games. Teens showing problematic online activity are divided into two parts: “Gamers” prone to problematic use of computer games (17%) and “Social media users” with problematic use of social media (25%). The rest are “Safe/functional e-users” (58%). The analysis indicates 2.5 times more boys among “Gamers” and 3.5 times more girls among “Social media users”. Problematic online activity among adolescents was associated with depressive symptoms and sensation-seeking, lower family cohesion and poorer parental monitoring.

Discussion: Normative and problematic online activities have become part of teenagers’ lives as 14 to 15-year-olds spend more time online than on any other activities. However, a large group of teenagers online activities are problematic.

Conclusions: The study results indicate the need to take into account e-users profiles and related psychosocial factors when developing prevention programmes to address adolescents’ problematic online behaviour.

Keywords: Adolescents, Social media, Online games, Problematic internet activities, E-users.

Drohobyczu ($n = 499$) i okolicznych obszarach wiejskich ($n = 454$). Ze względu na ograniczenia związane z pandemią, we Lwowie zastosowano kwestionariusz *online*, a w Drohobyczu i na wsi tradycyjny kwestionariusz. Metodologia została zaczerpnięta z badań mokotowskich.

Wyniki: Nastolatki spędzają najwięcej czasu *online* w mediach społecznościowych, na oglądaniu filmów, komunikacji za pośrednictwem komunikatorów oraz na grach *online*. Nastolatki wykazujące problemową aktywność *online* dzielą się na dwie grupy: „graczy” skłonnych do problemowego korzystania z gier komputerowych (17%) i „użytkowników mediów społecznościowych” skłonnych do problemowego korzystania z tych mediów (25%). Reszta uczniów to „bezpieczni/funkcjonalni e-użytkownicy” (58%). Analiza wskazuje na 2,5-krotnie wyższą liczbę chłopców wśród „graczy” i 3,5-krotnie wyższą liczbę dziewcząt wśród „użytkowników mediów społecznościowych”. Problemowa aktywność *online* nastolatków była związana z objawami depresji i poszukiwaniem doznań oraz niższą spójnością rodziny i gorszą kontrolą rodzicielską.

Omówienie: Normatywne i problemowe aktywności *online* stały się częścią życia nastolatków. Przebywanie w internecie zajmuje 14–15-latkom najwięcej czasu w porównaniu z innymi aktywnościami. Duża grupa nastolatków korzysta jednak z aktywności internetowych w sposób problemowy.

Wnioski: Wyniki wskazują na potrzebę uwzględnienia profili nastoletnich e-użytkowników i związanych z nimi czynników psychospołecznych przy opracowywaniu programów profilaktycznych dotyczących problemowych zachowań nastolatków w internecie.

Słowa kluczowe: młodzież, media społecznościowe, gry *online*, problemowe aktywności internetowe, e-użytkownicy.

■ INTRODUCTION

The internet, social media and smartphones are characteristic features of modernity. Digitalisation is an integral part of life, a medium of human interaction and daily activities. The e-world’s possibilities are an inexhaustible resource for enriching and improving the quality of life, while having a profound impact on human and social development. Contemporary studies of the relationship between people

and forms of the digital world focus on changes in people behaviour and values as well as changes in our physical and psychological well-being [1-4]. Human life in the world of new media stimulates reflection on how the digital revolution affects the functioning and psyche of modern people.

Online activity makes our lives easier in many areas and thus has considerable reward potential. Activities that have a high reward potential can quickly become problematic under conditions

of deficits in self-regulation skills. Internet use becomes problematic if online activity becomes compulsive, interferes with other activities of daily life and if the person is no longer able to control their use [5]. It is not only the online activity itself that can become problematic, but also what takes place via the internet when it becomes a medium driving other problems [6, 7].

Problematic internet activity can impair an individual's physical, mental, cognitive and/or social functioning [3]. Due to excessive use of computers and smartphones, physical health in particular cardiorespiratory health can deteriorate [2] as uncontrolled use of electronic devices contributes to sedentary lifestyles and reduces physical activity [1]. The possibility of constant connection leads to a blurring of the line between online and face-to-face communication [8]. Online communication increases the frequency of face-to-face communication but decreases social engagement [4]. The smartphone, as a medium for problematic internet use, online-gaming and social media abuse poses a threat to children's and adolescents's mental health.

A representative survey of Ukrainian teenagers' online activity (PISA-2018) shows high online activity. Sixty percent of Ukrainian 15-year-olds communicate several times a day in chat rooms or search for information online. In general, girls show a higher level of online activity [9]. The ESPAD-2019 survey [10] in Ukraine reveals a fairly high prevalence of risky online behaviour and related problems. More than half of teens (55%) admit they spend too much time on social media (predominantly girls); almost one in four report mood deterioration when unable to access social networks. About 27.5% of adolescents believe they spend too much time playing computer games, and almost 14% admit lower mood when they don't have the opportunity to play on a computer or smartphone. About a quarter (26%) of respondents reported that their parents say they spend too much time playing computer games.

Analysis of gender differences showed that boys spend more time than girls playing games on various electronic devices hence 27.6% of boys and 10.5% of girls spend more than 4 hours a day playing games online. At the same time, girls spend more time on social media: 29.1% of boys and 50.2% of girls spend more than 4 hours on social media, which tends to increase on weekends

[10]. A study of Ukrainian students found that 34.4% use a smartphone for more than 3 hours a day, and problematic smartphone-use symptoms were reported by 27.3% of respondents. It was notable that a higher level of problematic smartphone use among girls was significant predictor of social anxiety [11].

The Mokotów Study in Poland demonstrates significant changes in the structure of teenagers' extracurricular time during 2004-2020. One can observe a significant increase in internet activity as, in 2004, more than 1/4 of respondents did not use the internet daily when, in 2020, it was only about 1.5%; therefore the number of students who use the internet for more than 3-5 hours a day had almost tripled. In 2020, dysfunctional or risky internet use was found in almost 22% of teenagers. At the same time, significant gender differences were revealed: difficulties in controlling the use of the internet were more pronounced in girls, and gaming activity was more prevalent in boys. Meanwhile, the share of other extracurricular activities has significantly decreased in recent years. In particular, there was an increase in the percentage of students who do not read books for pleasure at all, while at the same time there is a significant decrease in those reading for more than 3 hours a day [12, 13].

Research on online activity is important for identifying problem-behaviour risk factors in order to shape educational policy and practice with the view to maximising the benefits of the internet while minimising its potential harms to children and adolescents' well-being [14]. It should be recognised however that the internet's dynamic development means that research will always lag behind actual events [15] with the changing content of one online activity or another. The common denominator of many studies is the distinction between general and specific internet activity, which can lead to different types (general and specific) of internet-related problems. For example, Griffiths and Davis emphasise the need to distinguish between specific (specific behaviours, gaming, online pornography, darknet, etc.) and generalised (compulsive internet use without dominant behaviours) internet-use disorder [16, 17]. Specific problematic internet use is associated with the individual's pre-existing problems (e.g., mental health problems), while generalised problematic internet use is associated with social isolation and the need for social contact [16].

Predictors of problematic and generalised internet-use disorders include a very wide range of psychological and social factors like introversion, psychotic disorders, social frustration combined with a high need for dominance, high levels of abstract thinking, individualism, non-conformism and dysfunctional attitudes toward the internet e.g., “In the real world I am worthless, but on the internet I have authority” [18: 100]. Low self-esteem, low motivation, fear of rejection and need for approval, and depression contribute to problematic internet use [19, 20]. Loneliness plays an important role in the adolescent problematic internet use also, particularly due to the lack of social support from peers and parents and the lack of the necessary social skills required for good social relationships [4, 21].

Most of adolescent problematic behaviours are associated with low self-control. Its deficiency is interpreted as a risk factor that triggers and sustains internet-use disorders [22]. Low self-control is a mediator between internet-use disorder, depression and loneliness [23, 24]. On the other hand, high levels of self-control, especially in adolescents, reduced the risk of problematic online activity [25]. Self-control deficits are particularly relevant to depressive states, which teens try to cope with by seeking sensations on the internet. Caplan [26] suggested that depressed mood may lead to seeking interpersonal interactions online to regulate mood and thus lead to dysfunctional internet use.

Some studies show a clear link between problematic online activity and adolescent depression [27–30]; teenagers who problematically use the internet or smartphones demonstrate significantly higher levels of depression, low self-esteem and pessimistic thoughts. These symptoms are also associated with poorer relationships with parents and a poor family atmosphere as well as problematic relationships with teachers. These factors are mainly identified as predictors of the emergence of problematic smartphone and internet use, although depression may be exacerbated by withdrawal from real-life social contacts. Some studies that highlight a clear link between problematic internet activity and depression among adolescents indicate that the association is primarily with girls [30].

The ambiguity of the relationship between depression and problematic internet use is also explained by that all activities are suppressed in severe depression. Specifically, it was found that in adoles-

cents with mild depression, the association between sensation seeking and problematic smartphone use was positive and significant, while for adolescents with severe depression, this association was insignificant [31]. Thus, analysis of the relationship between depression and problematic internet use and other e-problems requires attention to its level, to social factors and gender differences.

Family factors must be the focus of attention in the analysis of predictors of the emergence of problematic adolescent online activity. Effective parental monitoring can, and should, compensate for insufficient levels of adolescent self-control [25, 32]. A fraught family atmosphere and lack of parental oversight with respect to time spent on the internet, social media or electronic games were associated with a more severe course of depression, low self-efficacy, low self-esteem, and greater susceptibility to problematic internet use in adolescents [32]. Effective parenting, viewed as a balance of emotional warmth and parental protection, significantly reduces the risk of excessive internet use [33]. Parental love is an important factor in a person's psychological and social well-being, while deficits in parental support leads to developmental dysfunctions and, in particular, to risky and problematic behaviours [14].

The phenomenon of “online teens” has several specific characteristics. The internet is an ideal way to satisfy many needs, including the need for security, respect, love, recognition and self-actualisation. The ease with which these needs are satisfied on the internet and the lack of capacity to forgo opportunities to engage explains why teenagers are the most susceptible to developing problematic online activity. Children and adolescents are easily carried away by their emotions and have problems with self-regulation, making it necessary to develop and implement prevention programmes [3].

Today's school-aged children are rapidly mastering the technical skills of using the digital world. They see the internet as a new world of curiosity, excitement and improvement and tend to view their internet/social media use as less problematic than their parents judge [34]. For many of them, the smartphone and the internet are turning into a colourful, highly attractive, dynamic virtual reality devoid of ordinary problems and troubles, which is increasingly displacing the much more complex, everyday reality, saturated with responsibilities and demands. As a result, teenagers find

themselves in an environment full of not only new opportunities but also risks. These are a variety of risks, including content, communication, consumer, technical and finally those associated with the emergence of problematic internet use. This creates an urgent need to identify the risks and harm adolescents experience online to ensure that they are protected from the dangers of the internet and to maximise the benefits of the digital age [35].

The aim of the article was to analyse the internet activity of Ukrainian 14 to 15 year olds, with the specific objectives and research questions being:

1. Characteristics of internet activities

What is the place of internet activity in the structure of extracurricular activities of Ukrainian adolescents?

What are the dominant types of online activity among Ukrainian adolescents?

How do extracurricular activities and online activity vary by gender?

2. Problematic online activities

What is the percentage of adolescents at risk of problematic online activities?

How does this susceptibility vary by sociodemographic characteristics like gender, family composition and place of residence?

3. Types of e-users among teenagers

What types of e-users can be identified among teenagers?

How do e-users differ according to individual and family characteristics and mental health indicators?

■ MATERIAL AND METHODS

Sample

The study involved 2038 Ukrainian students (age 14-15 years) of which 971 were boys (47.64%) and 1067 were girls (52.35%). The territorial boundaries of the Ukrainian survey include Lviv Oblast, which is closest to Poland and the European Union. Data were collected in three populations of Ukrainian adolescents, living in Lviv ($n = 1085$), in the small town of Drohobych ($n = 499$) and in rural areas around Drohobych ($n = 454$). The sample was randomly selected to be representative for these three types of location.

Data collection

The study was conducted between November and December 2020 as part of an Ukrainian-Polish

survey. Due to COVID pandemic, the survey was conducted online in Lviv. The researchers prepared an online survey based on Google Forms and a packet of documents for principals, teachers and parents explaining the research purpose, objectives and procedure. A pilot survey was conducted in three ninth-grade classrooms in one of the schools not selected for the main study. The results of the pilot study helped to prepare the online survey and questionnaire. Prior to the running the survey, meetings were held with school officials to discuss the procedure for obtaining parental consent and to establish schedules for the study in school classrooms. Information about the study was posted in parent groups (on Viber, Messenger) along with a parental consent form indicating the time when the study would be conducted with each class as well as contact information for the Lviv Polytechnic National University person. None of the parents refused their child's participation in the survey.

The survey in the schools of Drohobych and its rural vicinity was conducted in classrooms using a paper-pencil questionnaire version. The interviewers were trained students from the Ivan Franko State Pedagogical University of Drohobych, who signed an undertaking to follow the "Guidelines for conducting surveys in schools during a pandemic". Each interviewer was assigned a school and a preliminary briefing was conducted. The survey lasted for one typical class hour (45 minutes). After completing the survey, the student placed the survey in an envelope and sealed it. No refusals were recorded among the students. The response rate in both locations Lviv and Drohobych/rural area was about 85%, which means that about 15% of students were absent from school in Drohobych and immediate rural areas and from online classes in Lviv (i.e., they did not join the online survey on the days arranged).

Instruments and variables

This study was based on the methodology of a Polish survey known as the Mokotów Study regularly conducted in Warsaw since the early 1980s [12], to which scales aimed at determining the problematic use of the internet, online games, social media and smartphones were added. There were four blocks of variables: 1) structure of offline/online regular leisure time, 2) problematic internet, games, social media and smartphones use, 3) individual characteristics and 4) family characteristics.

Structure of offline/online regular leisure time

1. The structure of regular leisure time was determined by the relationship between the seven daily activity types, which are [36, 37] playing computer games, internet (surfing different sites, writing e-mails, communicating in chats, social networks, playing online), online classes, homework, hobby/interest, time spent in the neighbourhood and reading books for pleasure. Adolescents were asked to indicate how much time per day they devote to a particular type of activity (5-point answer scale: from 1 = 0 hours to 5 = 5 hours or more).
2. The structure of organised activities in free time was based on the ratio of five types of activities [36, 37]: participation in organised sport sections, individual sport activities (cycling, rollerblading, visiting the pool, running, climbing, gym or other forms of physical activity), participation in other extracurricular activities (e.g., learning a foreign language, needlework, drawing) and unorganised free time like spending time in supermarkets, shopping and entertainment centres. Adolescents were asked to indicate how much time per week they devote to a particular type of activity (5-point answer scale from 1 = 0 hours to 5 = 8 hours or more). Because the survey took place during the COVID-19 pandemic when access to shopping and entertainment centres was limited, this variable was not taken into account in the analysis.
3. The hierarchy of leading activities carried out by adolescents on the internet was measured by a block of questions developed by a Polish team [13]. Students indicated how much time per week they spend communicating in social media (Instagram, TikTok), calling/messaging (Messenger, WhatsApp, Snapchat), playing online games (e.g., Minecraft, Simsy, League of Legends), using entertainment applications (YouTube, TikTok, Instagram, Pinterest), watching films, serials, anime (Netflix, CDA), using information and educational portals (online courses, Wikipedia, YouTube), devoting time to creative online activities (own blog, podcast, video), participating in the prosocial online activities (charity events, fundraising, ecology), online shopping or sites for adults (pornographic films, games for adults, hazard online). Answers were given on a five-point scale: from 1 = 0 hours to 5 = 8 hours or more.

For data processing, only the first five most popular types of online activities (social media, calling/messaging applications, online games, entertainment applications and watching films) were identified and presented in detail.

Problematic online activities

Questionnaires based on Griffiths' behavioural addiction criteria [38] were used to measure the problematic use of the internet, games, media and smartphones. The following four scales were used:

1. The Internet Disorder Scale-Short Form (IDS9-SF) [39]. The scale is based on the modified original nine Internet Gaming Disorder (IGD) criteria according to the DSM-5 [40] and is used to estimate the severity of Internet Use Disorder (IUD) (its effects) on any internet-enabled device over the past year. The questions focus on users' recreational online activities rather than academic or professional internet use. The nine questions must be answered using a 5-point Likert scale from 1 = "never" to 5 = "very often" (e.g., "Do you feel preoccupied with your online behaviour?"). Cronbach's $\alpha = 0.86$.
2. The Internet Gaming Disorder Scale-Short-Form (IGDS9-SF) [41], which estimates the level of IGD. The scale consists of 9 items reflecting all nine IGD criteria in the DSM-5 (e.g., "Do you feel more irritable, anxious or even sad when you try to either reduce or stop your gaming activity?"). Answers on a 5-point Likert scale from 1 = „never” to 5 = „very often”. Cronbach's $\alpha = 0.87$.
3. Bergen Social Media Addiction Scale (BSMAS) [42] which defines the level of Social Media Addiction (SMA). The scale consists of 6 questions about the symptoms of SMA (e.g., "Over the past year, how often have you spent a lot of time thinking about social media or planning to use social media"). Answers on a 5-point Likert scale from 1 = „very rarely” to 5 = „very often”. Cronbach's $\alpha = 0.82$.
4. Smartphone Application-Based Addiction Scale (SABAS) [43] is a 6-item scale (e.g., "Dealing with a smartphone is a way to change my mood; I get a buzz, I can run away or escape if I need it"), which estimates the proneness to Smartphone Application-Based Addiction (SABA). Responses on a 6-point Likert scale range from 1 = "strongly disagree" to 6 = "strongly agree". Cronbach's $\alpha = 0.82$.

Individual characteristics

1. Depressive symptoms were measured by the Polish adaptation of abbreviated version of the Center for Epidemiologic Studies Depression Scale (CES-D Scale) [44, 45]. The scale consists of 4 questions about symptoms of sadness, loneliness, dependency and crying in the last 7 days. Answers on the 4-point scale (from 1 = “never” to 4 = “always”). The Cronbach’s α = 0.86. The choice of this scale was mainly guided by practical considerations. The scale is short, adapted to adolescents and shows very good theoretical validity (high correlations with other measures of adolescent mental health problems e.g. the GHQ scale) [45].
2. Sensation seeking – the 4-questions scale asking how often in the past 6 months teenagers were doing something dangerous just for the thrill it evokes; riding bicycle or skating very fast, even risky, because it was exciting; doing some risky things because they were exciting and risking their safety staying out of home late in the evening because it was stimulating [46]. Answers on the 5-point Likert scale (from 1 = “never” to 5 = “very often”). Cronbach’s α = 0.77.
3. Impulsivity was measured using the Polish adaptation of the Shortened Barratt Impulsiveness Scale [47] consisting of two subscales: 1) self-control – four questions (e.g. “I carefully plan the tasks performed”), 2) impulsiveness – three questions (e.g. “I act without thinking”). Answers on the 4-point Likert scale (from 1 = “never or rarely” to 4 = “almost always or always”). In this study, the overall index of impulsivity was calculated as the sum of impulsivity and the reversed scale of self-control. Cronbach’s α = 0.58.

Family characteristics

1. Parental Monitoring Scale (PMS) – 9-item scale concerning parental awareness of what a child is doing out of home and with whom and how he/she spends own money [48], with 5-point Likert scale of answers (from 1 = „never” to 5 = „always”). Cronbach’s α = 0.90.
2. Parental monitoring of internet use – 3 additional items added to the Parental Monitoring Scale (PMS) (developed by a Polish team) [49], asking about parental knowledge of child’s activity in the internet with the same 5-point Likert scale. Cronbach’s α = 0.74.

3. Parental support scale – derived from the Family Life Questionnaire (FLQ) [50] measuring cohesiveness, expressiveness, conflict management within the family (Cronbach’s α for cohesiveness subscale – 0.85; for expressiveness – 0.84 and for conflict management – 0.46. The last subscale was not taken into account for statistical analysis). Answers on the 4-point Likert scale (from 1 = “definitely no” to 4 = “definitely yes”).
4. Family composition based on the single question *Who do you mostly live with at home?* – dichotomised into 1 = “two parents family” versus 2 = “other (single mother/father, step mother/father, living with other person(s))”.

Statistical analysis

Statistical analysis data processing was carried out in several stages in accordance with the research objectives and questions:

1. Descriptive statistics were used to analyse the place of internet activity in the general structure of extracurricular activities of Ukrainian teenagers and the prevailing types of internet activity. Gender differences were analysed using the SPSS option “compare column proportions” in the cross tables analyses. This option calculates pairwise comparisons for column proportions and indicates which pairs of columns (for a given row) are significantly different.
2. Prevalence of problematic online activities. Based on representative studies of two types of problematic online use (online gaming and social media), cut-off points were determined that indicate a serious risk of online gaming disorder [51] or problematic social media use [52]. The cut-off for the Internet Gaming Disorder Scale (IGDS) (value range 9-45) was 32 points [51]. On the social media-use scale (value range 6-30), the cut-off was 19 points [52]. To our best knowledge, cut-off scores for the Internet Disorder Scale-Short Form (IDS9-SF) and Smartphone Application-Based Addiction Scale (SABAS) are not available yet. According to Pontes and Griffiths, positive responses (“very often”) to five or more items on the IDS9-SF are used to distinguish between those with and without internet use disorders [39: 308]. Based on this criterium, a number of participants with internet use disorders were estimated.
3. Sociodemographic differences (by gender, family composition and place of residence) in proble-

matic online activities were analysed using descriptive statistics. Examination of the problematic online activity variables with the Kolmogorov-Smirnov test showed that they deviated slightly from a normal distribution. Therefore the Mann-Whitney *U* test was used to determine differences between groups.

4. The types of e-users among adolescents were determined with the help of cluster analysis (k-means clustering) according to the level of manifestation of problematic internet use. Cluster analysis was performed on the basis of total indicators of Internet Use Disorder (IUD), Internet Gaming Disorder (IGD) and Social Media Addiction (SMA). Problem smartphone use (SABA) was not included in the cluster analysis as it does not characterise the type of online activity but is only a means of accessing the internet. The correctness of the classification was confirmed by the results of discriminant analysis.

Before performing the k-means analysis, an outlier analysis was performed. *Z*-score = 3 was assumed to be the cut-off value. Therefore any *Z*-score greater than +3 or less than -3 was considered an outlier. No *Z*-score less than -3 was found in the data. However, approximately 50 records were found whose *Z*-score was greater than +3. Given the large size of the study group, it was decided to include the data of these individuals in the cluster analysis. To verify the correctness of this classification, a second cluster analysis was performed without outliers, which confirmed the correctness of the classification of these user groups.

All students were classified into variables representing three types of e-users:

1. "Safe/functional users" characterised by a low level of manifestation of problematic online activities.
2. "Gamers" – students prone to problematic online gaming.
3. "Social media users" – students prone to problematic use of social media.

Differences in individual and family characteristics between clusters were determined using a non-parametric alternative to one-way ANOVA: the Kruskal-Wallis *H*-test (examining differences between all clusters) and the Mann-Whitney *U*-test (for post-hoc pairwise comparisons of clusters).

The analysis was performed using SPSS 22 and STATISTICA 12.

■ RESULTS

Internet-based activities and other extracurricular activities

Based on the analysis, it was found that internet activity (surfing various sites, writing emails, communicating in chat rooms, social media, playing online) is the dominant type of leisure activity with 39.5% of students spending 3 or more hours a day active (Table I).

A separate question concerned computer games. Considering that the games mostly take place online, a total of almost 57% of teens spend more than three hours a day on the internet. In second place was time spent outside in the neighbourhood – about 35% of teens spend more than three hours daily outside. About 30% of teens spend more than three hours a day doing homework. Nearly the same number of students (29%) spend their free time on their hobbies/interests. Teens did not indicate whether the hobbies are offline or online activities as many teens may engage in editing videos or photos for posting on social networks. Online learning (10.2%) and reading (7.4%) ranked last in the structure of leisure time.

The structure of time spent on each type of activity differs significantly by gender. Girls spend significantly more time on the internet – more than 50% of girls and 27% of boys spend more than three hours a day online. At the same time, significantly more boys (31%) than girls (about 5%) play computer games more than three hours a day.

Teens spending more than 4 hours a week online, that is on social media 46% of them and on social media with entertainment content 39% (Table II). Twenty five per cent of teens spend more than 4 hours a week watching online videos, about 15% spend more than 4 hours a week chatting and corresponding on instant messaging and 15% spend more than 4 hours a week playing online games. Offline teen activities take up much less time; only about 12% of teens spend more than four hours a week in sport sections, about 12% - engage in individual sport activities and 9% attend other extracurricular activities (learning a foreign language, drawing). Thus, one can see the clear dominance of online activities in the lives of teenagers. Also, there are clear gender differences in all activities as girls spend more time on social media, entertainment sites, movies and other extracurricular activities like language courses. Boys prefer online games and offline sport activities.

Table I. Structure of adolescents' average daily leisure time: gender differences

Factor	0 hour n (%)	Less than 1 hour n (%)	1-2 hours n (%)	3-4 hours n (%)	5 and more hours n (%)
Computer games (total)	796 (39.1)	470 (23.0)	422 (20.7)	248 (12.2)	102 (5.0)
Boys	171 (17.6) ^a	196 (20.2) ^a	304 (31.3) ^a	212 (21.8) ^a	88 (9.1) ^a
Girls	625 (58.6) ^b	274 (25.6) ^b	118 (11.1) ^b	36 (3.4) ^b	14 (1.3) ^b
Internet (total)	201 (9.9)	424 (20.8)	609 (29.8)	480 (23.6)	324 (15.9)
Boys	142 (14.6) ^a	273 (28.1) ^a	294 (30.3) ^a	164 (16.9) ^a	98 (10.1) ^a
Girls	59 (5.5) ^b	151 (14.2) ^b	315 (29.5) ^a	316 (29.6) ^b	226 (21.2) ^b
Online lessons at school (total)	848 (41.6)	603 (29.6)	378 (18.6)	129 (6.3)	80 (3.9)
Boys	456 (47.0) ^a	275 (28.3) ^a	162 (16.7) ^a	46 (4.7) ^a	32 (3.3) ^a
Girls	392 (36.7) ^b	328 (30.7) ^a	216 (20.3) ^b	83 (7.8) ^b	48 (4.5) ^a
Homework (total)	132 (6.5)	481 (23.5)	809 (39.7)	458 (22.5)	158 (7.8)
Boys	86 (8.9) ^a	283 (29.1) ^a	404 (41.6) ^a	154 (15.9) ^a	44 (4.5) ^a
Girls	46 (4.3) ^b	198 (18.5) ^b	405 (38.0) ^a	304 (28.5) ^b	114 (10.7) ^b
Hobby (total)	219 (10.7)	461 (22.6)	764 (37.6)	394 (19.3)	200 (9.8)
Boys	107 (11.0) ^a	195 (20.1) ^a	359 (37.0) ^a	200 (20.6) ^a	110 (11.3) ^a
Girls	112 (10.5) ^a	266 (24.9) ^b	405 (38.0) ^a	194 (18.2) ^a	90 (8.4) ^b
Time spent outside the house (total)	250 (12.3)	493 (24.2)	576 (28.2)	454 (22.3)	265 (13.0)
Boys	127 (13.1) ^a	215 (22.1) ^a	287 (29.6) ^a	212 (21.8) ^a	130 (13.4) ^a
Girls	123 (11.5) ^a	278 (26.1) ^b	289 (27.0) ^a	242 (22.7) ^a	135 (12.7) ^a
Reading for pleasure (total)	822 (40.3)	727 (35.7)	339 (16.6)	99 (4.9)	51 (2.5)
Boys	488 (50.3) ^a	343 (35.3) ^a	99 (10.2) ^a	29 (3.0) ^a	12 (1.2) ^a
Girls	334 (31.3) ^b	384 (36.0) ^a	240 (22.4) ^b	70 (6.6) ^b	39 (3.7) ^b

Gender differences calculated at a significance level of $p < 0.05$ between pairs of rows (for a given column) were marked with index letters. Identical letters ("a" and "a") indicate no significant statistical gender differences while different letters ("a" and "b") indicate significant differences between row values. Significant differences are marked in grey.

Prevalence of problematic online activities

Thirty-nine adolescents in our study (1.9%) met the criterion for online gaming disorder, including 15 girls (1.4%) and 24 boys (2.5%). The results also indicate that 287 adolescents (14.1%) were at risk for social media addiction including 231 girls (21.6%) and 56 boys (5.8%). Furthermore, according to the criteria formulated by Pontes and Griffiths, 18 adolescents in our study (0.9%) show symptoms of internet use disorder, that is 14 girls (1.3%) and 4 boys (0.4%). Due to the lack of a cut-off point, the number of problematic smartphone users was not determined.

Problematic online activities by sociodemographics

The mean values of variables related to problematic online activity showed significant differences according to gender, family composition and place of residence (Table III). Adolescents of different

ages (14 vs. 15 years) were also compared though no significant differences by age were found.

Significant gender differences were observed for all four types of problematic online activity. Girls are more prone to problematic use of the internet, social media and smartphones, while problematic use of online games is more prominent among boys. Adolescents from families with only one parent or no parents at all have higher rates of problematic internet and smartphone use. Compared to residents of rural areas and Drohobych, adolescent residents of a regional centre (Lviv) are less prone to problematic online gaming but more prone to problematic social media use. Insignificant differences were found in the risk for problematic smartphone use.

Types of e-users among adolescents

On the basis of cluster and discriminant analysis (Wilks' Lambda: 0.15269, approx. $F(6.4066) = 1056.6$,

Table II. Structure of teenagers' average weekly online and offline activity: gender differences

Factor	0 hour n (%)	Less than 1 hour n (%)	1-3 hours n (%)	4-7 hours n (%)	8 and more hours n (%)
Social media (total)	126 (6.2)	315 (15.5)	669 (32.7)	533 (26.2)	395 (19.4)
Boys	99 (10.2) ^a	230 (23.7) ^a	347 (35.7) ^a	191 (19.7) ^a	104 (10.7) ^a
Girls	27 (2.5) ^b	85 (8.0) ^b	322 (30.1) ^b	342 (32.1) ^b	291 (27.3) ^b
Calling/mess app (total)	182 (8.9)	949 (46.6)	593 (29.1)	205 (10.1)	109 (5.3)
Boys	109 (11.2) ^a	476 (49.0) ^a	256 (26.4) ^a	78 (8.0) ^a	52 (5.4) ^a
Girls	73 (6.9) ^b	473 (44.3) ^b	337 (31.6) ^b	127 (11.9) ^b	57 (5.3) ^a
Online games	706 (34.7)	562 (27.6)	463 (22.7)	182 (8.9)	125 (6.1)
Boys	206 (21.2) ^a	242 (24.9) ^a	286 (29.5) ^a	133 (13.7) ^a	104 (10.7) ^a
Girls	500 (46.9) ^b	320 (30.0) ^b	177 (16.5) ^b	49 (4.6) ^b	21 (2.0) ^b
Entertainment app	89 (4.4)	362 (17.7)	796 (39.1)	458 (22.5)	333 (16.3)
Boys	58 (6.0) ^a	167 (17.2) ^a	415 (42.7) ^a	191 (19.7) ^a	140 (14.4) ^a
Girls	31 (2.9) ^b	195 (18.3) ^b	381 (35.7) ^b	267 (25.0) ^b	193 (18.1) ^b
Films	446 (21.9)	408 (20.0)	678 (33.3)	313 (15.3)	193 (9.5)
Boys	276 (28.4) ^a	234 (24.1) ^a	282 (29.1) ^a	108 (11.1) ^a	71 (7.3) ^a
Girls	170 (15.9) ^b	174 (16.3) ^b	396 (37.1) ^a	205 (19.3) ^b	122 (11.4) ^b
Organised sport clubs	1007 (49.4)	332 (16.3)	450 (22.1)	151 (7.4)	98 (4.8)
Boys	409 (42.1) ^a	157 (16.2) ^a	249 (25.6) ^a	89 (9.2) ^a	67 (6.9) ^a
Girls	598 (56.0) ^b	175 (16.4) ^a	201 (18.9) ^b	62 (5.8) ^b	31 (2.9) ^b
Other extracurricular activities	958 (47.0)	325 (15.9)	570 (28.0)	133 (6.5)	52 (2.6)
Boys	546 (56.2) ^a	151 (15.6) ^a	225 (23.2) ^a	37 (3.8) ^a	12 (1.2) ^a
Girls	412 (38.6) ^b	174 (16.4) ^a	345 (32.3) ^b	96 (9.0) ^b	40 (3.7) ^b
Individual sport activities	596 (29.3)	573 (28.1)	616 (30.2)	163 (8.0)	90 (4.4)
Boys	230 (23.7) ^a	265 (27.3) ^a	315 (32.4) ^a	105 (10.8) ^a	56 (5.8) ^a
Girls	366 (34.3) ^b	308 (28.9) ^a	301 (28.2) ^a	58 (5.4) ^b	34 (3.2) ^b

For an explanation of how to read the table see Table I.

$p < 0.0000$, correctness of classification – 94.2%), it is correct to distinguish three types of e-users: 1) Safe/functional users, 2) Gamers and 3) Social media users (Figure 1).

The categories created by the cluster analysis are unequal. “Safe/functional users” comprise 58% of study participants ($n = 1185$). Teens with problematic online activities fall into two groups: “Gamers” prone to problematic use of games (17%, $n = 341$) and “Social media users” prone to problematic social media use (25%, $n = 512$).

Analysis of gender differences among e-users indicates a significantly higher (2.5 times) number of boys among Gamers, a 3.5 times higher number of girls among Social media users, and a slightly higher number of boys among Safe/functional users (Table IV). There are slightly fewer Social media users among teenagers who live with both

parents. In a big city, there are fewer students who belong to the Safe/functional user group, significantly more students who are prone to problematic social media use, but slightly fewer Gamers compared to a rural area and a small town.

Individual and family differences among three types of e-users

As expected, adolescents who belong to Safe/functional user group had significantly lower scores on the IUD, IGD, SMA and SABA scales (Table V). At the same time, this group of adolescents had significantly lower depression and sensation-seeking scores, their family functioning was characterised by higher levels of consistency, expression and parental monitoring both offline and online.

Table III. Problematic online activities by sociodemographics

	Total N = 2038 Mean (SD)	Gender		Family composition		Place of residence				
		Boys n = 971 Mean (SD)	Girls n = 1067 Mean (SD)	Both parents n = 1711 Mean (SD)	Single parent or no parents n = 327 Mean (SD)	Rural area, Drohobych n = 953 Mean (SD)	Lviv n = 1085 Mean (SD)	Mann-Whitney U test		
IDS9-SF	16.38 (6.34)	15.56 (5.98)	17.13 (6.55)	16.19 (6.24)	17.40 (6.73)	15.99 (5.97)	16.72 (6.62)	440980.5***	249914.0**	491245.5 ^{ns}
IGDS9-SF	14.05 (6.08)	15.90 (6.25)	12.37 (5.41)	14.05 (6.04)	14.05 (6.34)	14.72 (6.01)	13.47 (6.09)	302600.5***	278097.6 ^{ns}	424188.0**
BSMAS	12.89 (5.12)	11.18 (4.40)	14.44 (5.21)	12.79 (5.06)	13.36 (5.31)	12.31 (4.79)	13.39 (5.31)	322883***	262682.0 ^{ns}	457097.0***
SABAS	14.57 (6.16)	12.71 (5.21)	16.28 (6.47)	14.35 (6.07)	15.78 (6.52)	14.88 (6.29)	14.31 (6.03)	349355.5***	244864.5***	490059.5*

IDS9-SF – Internet Disorder Scale-Short Form, value range 9-45, IGDS9-SF – Internet Gaming Disorder Scale – Short Form, value range 9-45, BSMAS – Bergen Social Media Addiction Scale, value range 6-30, SABAS – Smartphone Application-Based Addiction Scale, value range 6-36
 ***p ≤ 0.001; **p ≤ 0.01; *p ≤ 0.05 – significance levels based on U Mann-Whitney test (ns – no significance) between pairs of columns (boys/girls, both parents/single parent or no parent, rural area/Drohobych or Lviv)

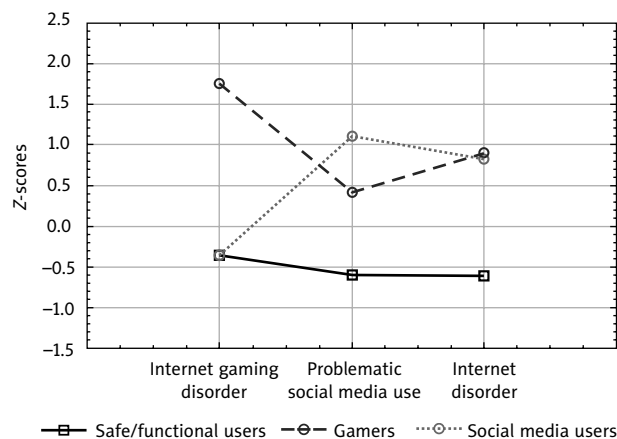


Figure 1. E-user profiles by types of online problematic activity: Plot of means for each cluster

The other two groups of e-users (Gamers and Social media users) have almost the same IUD scale scores but differ significantly in individual and family characteristics. Higher level of depression has been found among Social media users, while Gamers are characterised by higher level of sensation-seeking, as well as significantly lower rate of family expression and parental monitoring (both offline/online).

The preoccupation with gaming is more characteristic of boys and is associated with high levels of IUD, moderate levels of SMA, fairly high levels of SABA, higher levels of depression, highest levels of sensation-seeking and levels of impulsivity compared to those inclined towards safe/functional use of online activities. Adolescents in the Gamers group rate their families as the least emotionally involved (lowest levels of cohesion and expression as family characteristics) and less monitoring (low levels of parental control both offline and online). Among Social media users, there are high levels of IUD, the highest levels of SMA, SABA and depression. Representatives of both ‘unconstructive clusters’ (Gamers and Social media users) have higher levels of impulsivity compared to Safe/functional users.

DISCUSSION

All teenage activity can be conventionally divided into online (mediated by electronic technologies) and offline activity (at home and outside). A “shift” in the individual lives of teenagers towards the online dimension in relation to the amount of time they spend offline has been identified.

Table IV. Types of teenage e-users by sociodemographics

	Total N (%)	Gender		Family composition		Place of residence	
		Boys n (%)	Girls n (%)	Both parents n (%)	Single parent or no parents n (%)	Rural area, Drohobych n (%)	Lviv n (%)
S/FU	1185 (58.1)	630 (64.9) ^a	555 (52.0) ^b	1009 (59.0) ^a	176 (53.8) ^a	585 (61.4) ^a	600 (55.3) ^b
SMU	512 (25.2)	107 (11.0) ^a	405 (38.0) ^b	412 (24.1) ^a	100 (30.6) ^b	189 (19.8) ^a	323 (29.8) ^b
G	341 (16.7)	234 (24.1) ^a	107 (10.0) ^b	290 (16.9) ^a	51 (15.6) ^a	179 (18.8) ^a	162 (14.9) ^b

S/FU – safe/functional users, SMU – social media users, G – gamers

The differences calculated by z-test at a significance level of 0.05, between pairs of columns (boys/girls; both parents/single parent or no parents; rural area/Drohobych or Lviv) are marked with letters (a, b).

Table V. Types of e-users by problematic online activities and individual and family characteristics

Group/Indicator	Safe/functional users n = 1185 Mean (SD)	Social media users n = 512 Mean (SD)	Gamers n = 341 Mean (SD)	Kruskal- Wallis H test	Mann-Whitney U test, differences between pairs of clusters
Problematic online activities					
Internet Disorder Scale-Short Form (IDS9-SF) Value range 9-45	12.49 (3.04)	21.62 (5.41)	22.04 (6.17)	1157.60***	U ₍₁₋₂₎ = 33688.5*** U ₍₂₋₃₎ = 84644.5 ^{ns} U ₍₁₋₃₎ = 26744.5***
Internet Gaming Disorder Scale-Short Form (IGDS9-SF) Value range 9-45	11.91 (3.31)	11.88 (3.20)	24.72 (5.58)	844.67***	U ₍₁₋₂₎ = 298111.5 ^{ns} U ₍₂₋₃₎ = 989*** U ₍₁₋₃₎ = 5017***
Bergen Social Media Addiction Scale (BSMAS) Value range 6-30	9.84 (2.75)	18.53 (3.79)	15.02 (4.85)	1111.81***	U ₍₁₋₂₎ = 14394.5*** U ₍₂₋₃₎ = 48109*** U ₍₁₋₃₎ = 71481***
Smartphone Application-Based Addiction Scale (SABAS) Value range 6-36	11.85 (4.47)	18.78 (5.96)	17.74 (6.49)	550.09***	U ₍₁₋₂₎ = 107545*** U ₍₂₋₃₎ = 76667*** U ₍₁₋₃₎ = 93190.5***
Individual characteristics					
Depression Value range 1-4	1.6 (0.63)	2.22 (0.85)	2.04 (0.85)	243.74***	U ₍₁₋₂₎ = 167468.5*** U ₍₂₋₃₎ = 74882.5*** U ₍₁₋₃₎ = 140543.5***
Sensation seeking Value range 1-5	1.48 (0.65)	1.67 (0.75)	1.96 (0.91)	111.55***	U ₍₁₋₂₎ = 248701*** U ₍₂₋₃₎ = 71513.5*** U ₍₁₋₃₎ = 133406***
Impulsivity Value range 1-4	2.00 (0.45)	2.32 (0.46)	2.34 (0.45)	219.02***	U ₍₁₋₂₎ = 189625.5*** U ₍₂₋₃₎ = 86095.5 ^{ns} U ₍₁₋₃₎ = 122683***
Family characteristics					
Cohesion (family) Value range 1-4	3.3 (0.59)	2.96 (0.70)	2.91 (0.76)	143.39***	U ₍₁₋₂₎ = 212842.5*** U ₍₂₋₃₎ = 85314.5 ^{ns} U ₍₁₋₃₎ = 137255***
Expression (family) Value range 1-4	3.12 (0.69)	2.82 (0.76)	2.66 (0.73)	133.95***	U ₍₁₋₂₎ = 232746.5*** U ₍₂₋₃₎ = 76446.5*** U ₍₁₋₃₎ = 127944***
Parent monitoring offline Value range 1-5	3.80 (0.95)	3.77 (0.93)	3.30 (0.93)	92.68***	U ₍₁₋₂₎ = 295651.5 ^{ns} U ₍₂₋₃₎ = 59645*** U ₍₁₋₃₎ = 134634***
Parent monitoring online Value range 1-5	2.90 (1.13)	2.7 (1.11)	2.35 (0.94)	70.01***	U ₍₁₋₂₎ = 272659*** U ₍₂₋₃₎ = 70891.5*** U ₍₁₋₃₎ = 142725***

Clusters are marked as follows: 1 – safe/functional users, 2 – social media users, 3 – gamers

***p ≤ 0.001; **p ≤ 0.01 – significance levels based on Kruskal-Wallis H test and U Mann-Whitney test (ns – not significant)

The structure of Ukrainian teenagers' time is dominated by the internet, which ranks first regardless of gender, but among girls the percentage of those who spend more than 3 hours a day online is almost twice as high as among boys.

Activity outside home ranks second (after online activity) in terms of time for both boys and girls. Gender differences can be seen with respect to homework as twice as many girls do homework for more than 3 hours a day. It should be noted that neither online classes nor reading are among the favourite types of activities among today's Ukrainian teenagers though here also there are gender differences as girls devote significantly more time to these activities. Sport activity is more common among boys as they are twice as likely (more than 4 hours a week) to participate in individual sports and in sport sections. At the same time, one-third of girls do not engage in individual physical activity at all.

A detailed analysis of the structure of online activities reveals significant differences by gender. Among Ukrainian teenagers, gaming activity for more than 3 hours a day is six times more frequent among boys. Most studies show that males are more likely than females to use entertainment software like games, movies or music [53, 54]. These gender differences can be tracked from early school age through adolescence into adulthood [55-57].

Girls spend a significant amount of online time on social media and also more time watching videos. Entertainment apps (YouTube, TikTok, Instagram, Pinterest) occupy an important place in teenage girls' online lives. This is consistent with data from other studies, which indicate that girls are more likely to use smartphones for communication, watching videos and listening to music [13, 54], for interpersonal communication [13, 53, 55] and are more active social media users [13, 53, 56, 58].

Internet gaming disorder (IGD) was confirmed in 1.9% of Ukrainian adolescents, which is consistent with data from studies in other countries. According to a meta-analysis of studies from seven European countries [59], 1.6% of IGD was found in adolescents and 5.1% "at risk" for IGD. Slightly higher numbers of people with IGD are found in Asian countries, 5.4% in Thailand, 3.1% in Taiwan and 13.0% in China.

The percentage of SMA found is quite high as about 14% of adolescents were in the at-risk group, which is three times higher than the results of a simi-

lar Hungarian study on the same age group [52]. This can be explained due to 1) the cited study being conducted in 2015 while the results we obtained are a natural product of the popularisation of social media among adolescents and 2) we conducted our research during the COVID-19 pandemic when social media became the most accessible source of communication. At the same time, some studies find much higher rates of problematic internet use (about 40%) among Ukrainian teenagers [60]. These differences are difficult to explain in a meaningful way and are likely due to the use of different tools to study the problem.

Determining the types of e-users made it possible to identify the specific characteristics of those prone to a problematic online gaming, social media or adhering to constructive use of the internet. Most of the results that testify to the differences between the obtained clusters are in line with similar studies. According to the data of this study, a higher level of depression is associated with the tendency to use the internet unconstructively (the highest among those prone to problematic use of social media). According to research, depression is considered a predictor of problematic use of interactive media [61].

Research points to neuroticism as a common component of internalising mood disorders, including anxiety and depression [59]. Although there is still no consensus as to whether depression is a consequence or a cause of problematic internet use, creating a vicious cycle: depression drives people to seek refuge on the internet, problematic internet use can exacerbate depression [61, 62]. Internet use can also have positive effects on coping with emotional problems or depression if the internet and social media are used as a support network, an escape from negative thoughts and a coping mechanism, and to bring socially isolated people together [15]. Most studies of psychological predictors of problematic social media use emphasise the need for emotional self-expression of adolescents with high levels of Type D (distressed) personality. This is characterised by social inhibition stemming from fear of disapproval and negative reaction from others, which spills over into the strategy of maintaining social relationships on social media and may increase the likelihood of chewing, a problematic social media pattern [63].

The results of the study proved a higher level of impulsivity and sensation-seeking in both types

of problematic internet activity. In other studies, impulsivity, behavioural traits associated with aggression and hostility have also been identified as predictors of problematic internet use [59]. Thrill-seeking is also considered a common feature of the psychological mechanisms of various addictive behaviours [2], which was confirmed by the results though its role significantly depends on the type of e-activity and gender.

Numerous studies highlight the importance of the family in the emergence of problematic online activities. For example, it is recognised that the family environment of adolescents is the most significant factor in problematic smartphone use [56] as lower levels of family cohesion, more family conflict, and poorer family relationships contribute to addictive behaviours [59, 60]. Online interactions with others are important for adolescents' satisfaction with their lives as a source of social evaluation and support and as a possible substitute for insufficient parental involvement [58]. The results of this study confirmed the importance of the family composition, the quality of family relationships (cohesion and expression) and parental monitoring (both offline and online) as protective factors against the development of both types of problems (IGD and SMA).

An interesting direction for further research could be a focus on the differences in problematic use of the internet depending on adolescents' place of residence. Teenagers living in rural areas are more likely to use the internet safely and, at the same time, are more prone to problematic online gaming. It is obvious that there are different possibilities for the extracurricular life of teenagers in small towns and big cities, so attention to internet gaming can be a way of compensating for the limited possibilities of entertainment in the local community. At the same time, big cities produces their own challenges with respect to direct communication between teenagers. Under usual conditions, a big city is an environment that promotes a significant amount of skin-deep contacts as crowding and long distances limit the possibilities of high-quality direct communication. In 2020, at the height of the COVID-19 pandemic, the restrictions, which were observed much more strictly in the big city than in rural areas [64] became an obstacle to normal communication among urban-based teenagers. Perhaps the propensity for

problematic social-media use can be partially explained in this way.

■ LIMITATIONS

It should be taken into account that one of the methodological problems of studies of internet, social media and online game use is the difficulty of determining the duration and frequency of use of digital devices, since people use these devices more often than they report, due to the subjective underestimation of passive use time [65]. In this study, as in most others, time spent online was determined by self-report.

In the questionnaire, which determined the leading activities performed by adolescents online, it is possible to overlap the answers to the question about computer games. These may take place online and then also fall into the "internet" category, a similar situation applies to hobbies: for many adolescents, hobbies may involve editing photos/videos for social networking sites, which also includes online activity.

The problem of further research also remains to clearly define quantitative measures, criteria, cut-off points for problematic online activities.

■ IMPLICATIONS FOR FUTURE RESEARCH AND PREVENTION

Normative and problematic online activities have become part of teenagers' lives. Today's "digital generation" uses the internet for education, entertainment, self-development, leisure, communication with others, etc. Being online takes up the most time for 14-15-year-olds compared to other offline activities; life has, to a large extent, moved to the internet.

It can be said that the two main forms of problematic e-activity (games and social media), have different psychosocial characteristics. They differ significantly by gender, as well as by such factors as depression, impulsivity, family characteristics (family composition, parental online/offline control, cohesion and expression in family communication). A separate interesting result of the study was the "geographical" differences in problematic internet use: teenagers from rural areas, small towns, in which there are fewer opportunities for organised leisure time, are more prone to problematic internet

gaming, while teenagers from a big city are more prone to problematic social media use.

On the one hand, we analysed the differences obtained through the prism of differences in pandemic constraints in places of residence of different sizes, considering them as opportunities for leisure activities outside the home and parental communication with children. On the other hand, it is important to consider the persistent nature of differences in social and educational environments in rural and urban areas. We therefore see the prospect of further research in a more detailed analysis of the influence of socio-psychological factors such as the actual population of the locality: the number of peers in the place of residence, the number of friends and people with whom contacts are maintained, the number of virtual acquaintances, the availability of possible extracurricular activities and a more detailed analysis of the relationship between the structure of leisure time and problematic internet use.

Due to the war in Ukraine, the psychological stress of war as well as the time constraints resulting from the state of war and air raid alerts define the conditions and way of life of adolescents. Therefore it is particularly important to investigate the dynamics of leisure time and online activity. Repeating this study with a possible additional question focus is important to identify the dynamics of internet use and the psychological and socio-psychological predictors of problematic internet use. At the same time, the differences in living conditions (in Ukraine and Poland) lend the study a quasi-experimental format and aid the identification of these specific factors' influence.

The results indicate the need to take gender specificity and other psychosocial factors into account when developing prevention programmes for adolescents' problematic online behaviour.

The results of our research lead to conclusions for the prevention of problematic online activities. Previous experiences indicate the effectiveness of the approach of strengthening protective factors in an ecological context, related to the adolescent's environment, family, social networks, communities [66]. In this respect, STEM (Science, Technology, Engineering and Mathematics) clubs and sport sections for adolescents are recommended in rural areas. This can satisfy their need to be active and their need for adventure. The systematic organisation of competitions for members of sport clubs can contribute to the need for sensation-seeking. In large cities, where the offer of extracurricular activities is more diverse but still insufficient, the above approach would also be appropriate. Activities of this kind would also contribute to strengthening face-to-face communication with peers among adolescents, which is increasingly shifting to social media.

The results obtained, indicate the need to involve the family in the prevention activities. Especially, we should take into account the protective effect of the family on the emergence of problematic internet use [66]. At the same time, we should be aware that inappropriate parental disciplinary behaviours (physical and psychological aggression) may be counterproductive and increase the risk of problems. Even recommended disciplinary behaviours (withholding treats or pocket money, grounding the adolescent) may not be effective [67]. Therefore simply establishing a system of parental control over an adolescent's internet use may not be sufficient. A more effective strategy is to plan the constructive leisure time adolescents share with parents (relaxation, sports, games, travel) and to teach parents to use non-aggressive disciplinary techniques that give the adolescent child psychological autonomy.

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Conflict of interest/Konflikt interesów

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Ethics/Etyka

The project “The Mokotów study 2020. Monitoring risk behaviours, addictive behaviours and mental health problems among 15-year-old adolescents” was approved by the Bioethics Committee of the Institute of Psychiatry and Neurology in Warsaw, Resolution No. 18/2012. Permission to conduct research has been extended until 14.06.2022 by a letter from the President of the Commission on 10.09.2020.

In order to comply with the legislation in force in Ukraine, the questionnaire was checked by specialists from the Cabinet of Psychology and Social Work of the Lviv Regional Institute of Postgraduate Pedagogical Training, who gave a positive opinion on the possibility of using the questionnaire for survey research in schools of Lviv region (Ukraine).

The work described in this article has been carried out in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki) on medical research involving human subjects, Uniform Requirements for manuscripts submitted to biomedical journals and the ethical principles defined in the Farmington Consensus of 1997.

Projekt „Badania mokotowskie 2020. Monitorowanie zachowań ryzykownych, zachowań nałogowych i problemów zdrowia psychicznego wśród 15-letniej młodzieży” uzyskał zgodę Komisji Bioetycznej Instytutu Psychiatrii i Neurologii w Warszawie: Uchwała nr 18/2012. Pozwolenie na prowadzenie badań zostało przedłużone do 14.06.2022 r. pismem Przewodniczącej Komisji z 10.09.2020 r.

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