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**PROBLEMATIC SOCIAL MEDIA USE AMONG ADOLESCENTS  
(PSYCHOLOGICAL ASPECT)**

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## INTRODUCTION

### **Relevance of the research**

The use of social media (SM) has become increasingly prevalent in modern-day communication, serving as a means for online communication and interaction, information sharing. According to the Digital 2023 and 2024 Global Statistical Report on Digital Technology [Digital 2023: Global Overview Report, 2023; Digital 2024: The Russian Federation, 2024]. In Russia, according to the research company Mediascope Web Index, social media are the most used platform on the Internet [Mediascope, 2023]. In 2023, about 106 million Russians used social media, which is 72.4% of the Russian Federation population [Statista, 2023]. At the same time, among users aged 14 to 17 years old, 99% go online, and have at least one account on social media – 97%, which is the highest percentage among all age groups [Kuzina L.S., Streltsova E.A., 2023].

Statistical reports and monitoring studies show an annual increase in the use of electronic communications, the Internet and social media, with little prospect of restricting and controlling their use. For more than 25 years, research scientists, as well as experts from the World Health Organization, have been discussing the signs of potentially negative effects of electronic devices, individual programmes and applications on the physical and mental well-being of users [World Health Organisation. Regional Office for Europe, 2019]. Problematic social media (PSMU) use is of particular scientific interest in the context of Internet addictive behaviour, which is the most studied phenomenon in the field of digitalisation and meets the main criteria of addictive behaviour [Andreassen C.S., Pallesen S., Griffiths M.D., 2017; Egorov A.Y., 2020].

Russian and foreign researchers use various terms to describe the behaviour that results in the formation of signs of addiction (dependence) in relation to the use of social media or applications for online communication, for example, problematic social media use, addiction to social media, Internet communication disorder, etc. [Andrews N.P. et al., 2020; Egorov A.Y., Soldatkin V.A.; Wegmann E, Brand M., 2020]. [Andrews N.P. et al., 2020; Egorov A.Y., Soldatkin V.A.; Wegmann E., Brand M., 2020]. In the present study, the concept of "problematic use" is applied due to the following aspects: 1) the

concept of "problematic use" is actively mentioned in scientific discussions by Russian specialists in the field of clinical psychology when describing forms of non-chemical forms of addictive behaviour as less stigmatizing, compared to the concept of "addiction" [Gerasimova A.A., Kholmogorova A.B., 2018; Sirota N.A. et al., 2018; Trusova A.V. et al., 2019]; 2) the concept of "problematic use" allows a distinction to be made between behavioural forms of addictive behaviour, which are not independent nosological entities, and new forms of addictive disorders [ICD-11: International Classification of Diseases 11th Revision].

Adolescents and young people are more likely to be exposed to problematic social media use and the internet due to their high level of online activity. They also have a special psychological vulnerability to the formation of addictive behaviour. [Kolmogortseva A.A., Rylskaya E.A., 2021].

Problematic social media use can have negative consequences for the psychological well-being of adolescents. This includes signs of addictive behaviour such as a preference for online social interactions over offline communication, using social media to regulate emotional state, cognitive preoccupation, and compulsive use. Scientific research aimed at preventing problematic social media use, which has notable addictive potential, is in high demand in the era of digitalisation across various spheres of modern adolescent and young adult life, particularly in education.

The relevance of further research is determined by: 1) the need to systematise methods of psychological diagnostics and criteria of problematic social media use; 2) differentiation of problematic social media use from the low level of risk of developing addictive behaviour from the use of social media; 3) the limited number of studies on the prevalence of problematic social media use and its interrelated psychological features among Russian adolescent students; 3) the limited number of studies on the prevalence of problematic social media use and its interrelated psychological features among Russian adolescent students; 3) the limited number of studies on the prevalence of problematic social media use among Russian adolescent students

### **The degree of scientific development of the research issue**

Initially, in the studies of Russian and foreign authors the phenomenon of problematic social media use was considered as a type of online activity with dependence on the Internet in the context of socio-humanitarian research. [Caplan S.E., 2002; Davis R.A., 2001; Griffiths M., 1998; Asmolov A.G., Tsvetkova N.A., Tsvetkov A.V., 2004; Voyskunsky A.E., 2004; Young K. et al., 1999]. and natural-science disciplines [Egorov A.Y., Golenkov A.V., 2005; Korolenko C.P., Dmitrieva N.V., 2001; Loskutova V.A., 2005; Malygin V.L., Iskandirova A.I., Feklisov K., 2011; Perezhogin L.O., Vostroknutov N.V., 2009]. This trend continues at present among Russian researchers who reveal complex clinical, biological, genetic and individual-psychological predictors of Internet addictive behaviour [Grechanyi S.V. et al.; Egorov A.Y., Soldatkin V.A.; Egorov A.Y. et al., 2020; Kibitov A.O., Trusova A.V., Egorov A.Y., 2019; Kolesnikov V.N., Melnik Y.I., Teplova L.I., 2019; Malygin V.L. et al., 2011; Kholmogorova A.B., Gerasimova A.A., 2019].

Problematic social media use is the subject of a number of contemporary studies, usually in certain highly specialised areas of scientific knowledge. Clinical and psychological features and phenomenology of problematic social media use have been studied by Griffiths M., Marino C., Andreassen C.S., Pallesen S., Rakhimkulova A.S., Sheinov V.P. The prevalence of problematic social media use is reflected in the works of Inchley J.C., Boer M., Soldatova G.U., Yeritsyan K.Y. The development of reliable diagnostic tools for assessing the severity of problematic social media use was carried out by Marino C., Van den Eijnden R.J.J.M., Andreassen C.S., Pallesen S. Sheinov V.P., Adaptation and validation of diagnostic scales on the Russian sample was carried out by Sirota N.A., Moskovchenko D.V., Rozanov V.A., Zotova D.V. Interrelations of signs of problematic social media use with individual-psychological features of personality were determined in a number of studies of Griffiths M., Kuss D., Wang J.L., Andreassen C.S., Chen H., Pontes H.M., Soldatova G.U., Sobkin V.S., Rakhimkulova A.S., Ruzhenkov V.A., Lukyantseva I.S., Solodnikova V.V., Luchinkina I.S.

There are practically no studies devoted to the prevention and correction of problematic social media use. Individual forms of work were described in methodological

materials on the topic of Internet addictive behaviour [Antonenko A.A., 2014; Buzina T.S., 2018; Malygin V.L. et al., 2017, 2011; Soldatova G.U. et al., 2022]. However, they have not been implemented in the practical work of mental health professionals.

In the works published so far, there are a number of methodological difficulties associated with numerous nominative definitions of the observed behavioural disorder, lack of uniformity of diagnostic criteria and gradation of the degree of expression of signs of problematic social media use, insufficient number of valid and reliable diagnostic tools, which leads to disparate results of available studies.

In connection with the above, the study of problematic social media use and the interrelated features of adolescents' personality to determine the tasks of psychological prevention seems relevant and necessary.

**The purpose** of the study was to identify the characteristics of problematic social media use and the personality traits associated with it among adolescent students.

To achieve this goal, the following **tasks** had to be completed:

1. To conduct a theoretical and methodological analysis of the use of social media in the context of modern ideas about behavioural addictions.
2. To determine the relationship between problematic use of social media and internet addictive behaviour.
3. To identify gender differences of problematic social media use among adolescents.
4. To present the structural conditionality of the expression of problematic social media use, based on the peculiarities of motivational, semantic and psycho-emotional spheres of adolescents' personality.
5. To identify predictors of problematic social media use among adolescents.
6. To develop practical recommendations on psychological prevention of problematic social media use on the basis of the identified features of problematic social media use, as well as the characteristics of motivational, semantic and psycho-emotional spheres of adolescents' personality.

**The object of study** was the problematic social media use as a form of addictive behaviour.

**The subject of the study** was the psychological aspects of adolescents' problematic social media use.

**General research hypothesis:** problematic social media use is associated with various features of adolescents' personality in the motivational, semantic, and psycho-emotional spheres. These features should be considered when developing psychological prevention strategies.

**Research hypotheses:**

1. Problematic social media use is associated with Internet addictive behaviour.
2. There are several differences in the motivational and semantic sphere of adolescents with varying levels of problematic social media use.
3. Problematic social media use is associated with higher rates of psycho-emotional stress.

**Research methodology and methods**

Theoretical and methodological basis of the work were: concepts of non-chemical addictions [Egorov A.Yu., 2020; Korolenko C.P., Dmitrieva N.V., 2001; Mendelevich V.D., 2012; Tsygankov B.D. et al., 2007]. and multidisciplinary studies of Internet addictive behaviour [Voyskunsky A.E., 2015; Grechanyi S.V. et al.; Egorov A.Y., 2015; Kibitov A.O., Trusova A.V., Egorov A.Y., 2019; Loskutova V.A., 2005; Soldatova G.U. et al., 2022; Trusova A.V. et al., 2021; Kholmogorova A.B., Gerasimova A.A., 2019]; general psychopathology of narcological diseases [Bedina I.A. et al., 2020n; Ivanets N.N. et al., 2020].; syndromal model of a behavioural disorder that has a common biological basis with chemical and non-chemical addictions [Shaffer H.J. et al., 2004].

**Scientific novelty**

For the first time, a study has been conducted on the psychological aspects of problematic social media use among adolescents aged 15-17.

The study presents the structural conditionality of problematic social media use based on the obtained correlations between the signs of problematic social media use and the motivational, semantic, and psycho-emotional characteristics of adolescents.

The examination of psychological characteristics enabled the identification of predictors for problematic social media use among adolescents.



### **Theoretical significance of the study**

The theoretical and methodological analysis conducted enabled us to define problematic social media use as a behaviour characterised by a tetrad of signs: pronounced and stable signs of addiction, in which the object of addiction is Internet communication activity and/or online social activity; prolonged use of social media (more than 6 hours a day); preference of online communication over live interaction, and the use of social media to alter mood.

The psychological aspects of problematic social media use by adolescents have been identified. The available data on this form of addictive behaviour has been expanded. The obtained data includes the results of theoretical and methodological analysis of the problem of social media use in the context of modern ideas about behavioural addictions and it can be used to clarify existing typological models of behavioural (non-chemical) addictions, particularly in relation to the child-adolescent population.

The regression analysis identified predictors for the formation of problematic social media use among adolescents. The obtained data can be extrapolated to wider age groups to implement programmes that prevent addictive behaviour related to social media use.

### **Practical relevance of research**

The methodological complex of psychodiagnostic tools developed for assessing the severity of problematic social media use among adolescents, along with the formulated recommendations for preventing the formation of dependence on social media, can be used in individual and group work by specialists in the education, healthcare, and social welfare systems

### **Reliability and validity of the research results**

The reliability and validity of scientific provisions and conclusions are ensured by a detailed theoretical analysis of the problem of social media use among adolescents, the relevance of the methodological apparatus, including the use of a set of diagnostic tools adequate to the purpose and objectives of the study, the correct application of modern methods of statistical processing of the obtained data.

The empirical material of the thesis is based on a large sample of adolescent school students from 13 educational institutions of several Moscow region districts. The study

was conducted in compliance with international ethical and scientific standards for planning and conducting research involving human subjects.

### **Personal contribution of the author**

The study design based on a preliminary analysis of Russian and foreign literature, prepared the individual examination card in paper and electronic format, the information sheet and informed consent forms were developed by the author.

The survey of 723 school students was conducted independently by the author, as well as the subsequent analysis, interpretation, and generalisation of the results obtained, including mathematical processing of the data. The author formulated practical recommendations for the prevention of problematic social media use based on the study results.

### **Approbation and implementation of the study results**

The thesis materials are described in 10 publications, including 4 articles in Russian publications listed by the Higher Attestation Commission under the Ministry of Education and Science of Russia, and 2 articles in Russian publications listed in the Scopus database.

The study results were presented at the Scientific and Practical Conference "Coronavirus and protection of mental health of the population: clinical, neurobiological, preventive and organisational aspects" (Moscow, 2022); at the All-Russian interdisciplinary anti-drug scientific and practical forum "Actual issues of addictology" (Nizhny Novgorod, 2022); at the All-Russian Congress with international participation "Psychoneurology: Century XIX – Century XXI" (St. Petersburg, 2022); at the 5th Kostroma All-Russian School of young scientists and specialists in the field of mental health (Kostroma, 2022); at the Kochenov Readings 2022 "Psychology and Law in Modern Russia" (Moscow, 2022).

The main results of the research were presented at the meetings of the Problem Council on Medical Psychology and the Problem Council on Social, Clinical Narcology and Organisation of Narcological Care of the Federal State Budgetary Institution "V.Serbsky National Medical Research Centre for Psychiatry and Narcology" Russian Federation Ministry of Health. The results are also reflected in the materials of lectures of the additional professional educational programme of advanced training, conducted on

the basis of "V.Serbsky National Medical Research Centre for Psychiatry and Narcology" Russian Federation Ministry of Health.

Approbation and implementation of the results of the study in the practical work of medical psychologists and doctors of psychiatrists-drug addicts were carried out in the State Budgetary Institution of the Ministry of Health of Moscow Region "Moscow Regional Clinical Narcological Dispensary, MRCND" (branch No. 1 in Korolev, branch No. 7 in Odintsovo, branch No. 5 in Shchelkovo) and the State Budgetary Institution of the Ministry of Health of the Russian Federation "Nizhny Novgorod Regional Narcological Dispensary, NRND" (dispensary and polyclinic department No. 2 for children's population).

### **Structure and volume of the thesis**

The dissertation research is presented in Russian and English languages. The Russian version of the text is presented on 179 pages, the English version – on 156 pages. The dissertation comprises an introduction, a theoretical part (Chapter 1), a description of the organisation, materials, and research methods (Chapter 2), an empirical part (Chapter 3), a discussion of the research findings (Chapter 4), a conclusion, findings, and practical recommendations on prevention of formation of problematic social media use, thesaurus and acknowledgements. It includes a list of references comprising 234 publications (130 in Russian and 104 in English), and 14 appendices. The research is illustrated with 15 tables and 13 figures.

### **Acknowledgements**

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### **Publications**

1. Shakun E.YU., **Lanovaya A.M.**, Fadeeva E.V. Addiction and Problematic Internet Use Among Girls and Adolescent girls: Prevalence, Main Features and Measures (A Review of Russian Studies) // *Konsul'tativnaya psihologiya i psihoterapiya =*

Counseling Psychology and Psychotherapy. 2022. – V. 30(2). – P. 45-66. – DOI: 10.17759/cpp.2022300204 (In Russ.)

2. **Lanovaya A.M.** Social Media Problematic Use and Internet Addictive Behavior among Adolescents in the Moscow Region // *Psihiatriya = Psychiatry*. – 2022. – V. 20(3-2). – P. 105-107.

3. **Lanovaya A.M.,** Fadeeva E.V. Problematic Use of Social Media in Adolescents with Internet Addictive Behavior: Preliminary Results // *Psihologiya. Psihofiziologiya = Psychology. Psychophysiology*. 2022. – V. 15(4). – P. 59–71. – DOI: 10.14529/jpps220406 (In Russ.)

4. **Lanovaya A.M.,** Fadeeva E.V. Gender differences of Problematic Social Media Use // *Psihologiya. Psihofiziologiya = Psychology. Psychophysiology*. 2023. – V. 16(1). – P. 51-62. – DOI 10.14529/jpps230105 (In Russ.)

5. **Lanovaya A.M.** Features of empathy among adolescents with different level of problematic social networks use // *Vestnik psihoterapii = The Bulletin of Psychotherapy*. 2022. – No 84. – P. 56–63. – DOI: 10.25016/2782-652X-2022-0-84-56-63 (In Russ.)

#### **Main scientific results:**

1. According to the results of the study on problematic use of social media in relation to internet addictive behaviour, the majority of adolescents (83.4%) aged 15-17 years show a tendency to excessive use of PSMU, while only 5.7% reach the level of addictive behaviour.

The scientific result is presented in the publication: **Lanovaya A.M.,** Fadeeva E.V. Problematic Use of Social Media in Adolescents with Internet Addictive Behavior: Preliminary Results // *Psihologiya. Psihofiziologiya = Psychology. Psychophysiology*. 2022. – V. 15(4). – P. 59–71 on page 63.

The personal contribution of the thesis was to collect, process and analyse the data and draw conclusions about the expression of problematic social media use among adolescents.

2. Problematic social media use is defined as behaviour associated with prolonged and addictive use of social media and is characterised by the presence of the same signs

of addictive behaviour as internet addiction: the presence of difficulties in control and self-regulation, cognitive preoccupation and negative consequences due to excessive use.

The scientific result is presented in the publications: **Lanovaya A.M.**, Fadeeva E.V. Problematic Use of Social Media in Adolescents with Internet Addictive Behavior: Preliminary Results // *Psihologiya. Psihofiziologiya = Psychology. Psychophysiology*. 2022. – V. 15(4). – P. 59–71 on pages 61 and 65; **Lanovaya A.M.** Current issues in terminology, prevalence, and diagnostic methods of social media problematic use in Russia // All-Russian congress with international participation "Psychoneurology: Century XIX - Century XXI", dedicated to the 115th anniversary of FGBU "NMPC PN named after V.M. Bekhterev" of the Russian Federation Ministry of Health and 165th anniversary of V.M. Bekhterev's birth, St. Petersburg, – St. Petersburg: "V.M. Bekhterev National Medical Research Centre for Psychiatry and Neurology" of the Russian Federation Ministry of Health, 2022. – P. 59-61 on page 61.

The personal contribution of the thesis author was to collect, process and analyse data, formulate conclusions and define the term "problematic social media use".

3. The following gender differences in problematic use of social media are highlighted: girls are more prone to problematic use of social media mainly for regulation of emotional state with the component of cognitive preoccupation and compulsive use; in males there is a correlation between preference for online communication and prolonged use of social media.

The scientific result is presented in the publications: **Lanovaya A.M.** Problematic Social Media Use and Internet Addictive Behavior among Adolescents in the Moscow Region // *Psihiatriya = Psychiatry*. – 2022. – V. 20(3-2). – P. 105-107 on page 105; **Lanovaya A.M.**, Fadeeva E.V. Gender differences of Problematic Social Media Use // *Psihologiya. Psihofiziologiya = Psychology. Psychophysiology*. 2023. – V. 16(1). – P. 51-62 on pages 55-58; Shakun E.YU., **Lanovaya A.M.**, Fadeeva E.V. Addiction and Problematic Internet Use Among Girls and Adolescent girls: Prevalence, Main Features and Measures (A Review of Russian Studies) // *Konsul'tativnaya psihologiya i psihoterapiya = Counseling Psychology and Psychotherapy*. 2022. – V. 30(2). – P. 45-66. – DOI: 10.17759/cpp.2022300204 (In Russ.).

The personal contribution of the thesis author was to conduct theoretical research, to collect, process and analyse the empirical data and to draw conclusions about reliable differences in problematic social media use among adolescent girls and boys.

4. Peculiarities of the motivational and semantic sphere of adolescents with expressed signs of PSMU use include: lack of purposefulness and dissatisfaction with current self-realisation due to difficulties in controlling the time of social media use, focus on the future without specifying ideas for planning and achieving the desired goals, reduced ideas about the possibilities of managing their own lives.

The scientific result is presented in the publications: **Lanovaya A.M.**, Fadeeva E.V. Analysis of correlations between the problematic social media use and sense-life orientations of adolescents // Kochenov Readings 2022 "Psychology and Law in Modern Russia". Collection of abstracts of participants of the All-Russian conference on legal psychology with international participation. – M.: MSUPE, 2022. – P. 201-203 on page 202; **Lanovaya A.M.** The Perception of Happiness in Adolescents with Different Severity Levels of Problematic Social Networking Sites Use // Collection of materials of the XVI All-Russian School of young psychiatrists "Suzdal-2023" in memory of Peter V. Morozov. – 2023. – P. 289-293 on pages 292-293.

The personal contribution of the thesis author was to collect, process and analyse the data and to formulate conclusions about the peculiarities of the motivational and semantic sphere of adolescents with pronounced signs of PSMU.

5. Peculiarities of empathy in adolescents with expressed signs of problematic social media use include: a decrease in emotional sensitivity to unfavourable consequences due to the priority use of social media and a higher assessment of empathy skills with a tendency to decrease in the presence of obsessive thoughts about PSMU use.

The scientific result is presented in the publication: **Lanovaya A.M.** Features of empathy among adolescents with different level of problematic social networks use // Vestnik psihoterapii = The Bulletin of Psychotherapy. 2022. – No 84. – P. 56–63 on page 61.

**The following statements are defended:**

1. Problematic social media use among adolescents is characterised by a tetrad of features: manifestations of addictive behaviour, prolonged use of social media, social media use for mood changes, and preference for online communication over face-to-face interaction.

2. Problematic social media use and Internet addictive behaviour are closely related and share common features of addiction: difficulty controlling, preoccupation with addictive behaviour, and continued engagement despite clear signs of negative consequences.

3. Gender differences in problematic social media use include: for girls – greater susceptibility to problematic social media use mainly for regulation of emotional state with a component of cognitive preoccupation and compulsive use; for boys – the association of preference for online communication with prolonged social media use.

4. The structural conditionality of problematic social media use among adolescents is characterised by: a lack of purposefulness and dissatisfaction with current self-realisation due to difficulties in controlling the time spent on social media; a focus on the future without specifying goals and plans; reduced ability to empathise due to obsessive thoughts about social media use; expressed signs of anxiety and stress, depression and reduced emotional background when realising the negative consequences of social media use.

5. The results of the study allowed to identify the following predictors of problematic social media use: reduced goal-setting skills, decreased emotional sensitivity, prolonged use of social media on weekends, and high levels of anxiety.

## **CHAPTER 1. CHAPTER 1. THEORETICAL AND METHODOLOGICAL ASPECTS OF STUDYING PROBLEMATIC SOCIAL MEDIA USE IN THE CONTEXT OF MODERN IDEAS ABOUT BEHAVIORAL ADDICTIONS**

In modern society, even mental health professionals are beginning to shift their attitudes towards the use of digital devices (such as smartphones, tablets, and personal computers) by different segments of the population. As digital technologies increasingly mediate social interactions in various spheres of life, such as work, study, family, and friendship relationships, society is undergoing a shift from a 'human-to-human' format to a 'human-to-digital device-to-human' format [Lupton D., 2019]. In particular, a number of researchers in their scientific works focus on the fact that digitalisation, as a social and cultural phenomenon, provides greater opportunities for education, careers and the acquisition of new competences, positively affecting the communicative sphere; and digital technologies can be used to promote mental and physical health [Lupton D., 2019; Rich E., Lupton D., 2022].

However, it is important to not only highlight the positive effects of digitalisation on modern society but also to thoroughly analyse the potential negative impacts of social media and the internet on individual psychological characteristics and emotional well-being. This is especially important in relation to the development of addictive behaviours among vulnerable groups of population.

### **1.1. Social media and their significance for society**

The current study focuses on the psychological aspects of problematic social media use among adolescents in the online space. However, since we use the term "social media" as a synonym for "social networks", it seems important to mention the history of the emergence and study of the term.

Many scholars engaged in philosophy and sociology contributed to the formation of the concept of "social networks", studying the similar phenomenon of "social structures" in the late 19th – mid-20th centuries [Levi-Strauss K., 2001; Parsons T., 2000; Sorokin P.A., 1992; Tennys F., 2002]. Durkheim E. was the first to put forward provisions on social reality, formed by interaction of individuals, within which there are social facts,



including phenomena related to collective consciousness (traditions, language, ideas, myths, etc.) and state aspects (geographical conditions, living conditions, etc.), which are able to exert external coercion on the individual [Durkheim E., 1995]. About social ties based on personal values and beliefs, later in his works wrote Tannis F. According to his ideas, social associations of people "derive their main content from the very community of spirit and are not only maintained but also concluded on the basis of free will" [Tannis F., 2002, p. 299]. Zimmel G. and Spencer H. represented the whole range of human interactions as a network structure, including individuals and social groups, as well as the processes of communication carried out between them [Spencer H., 1898; Skirbekk G., Guillet N., 2022]. Sorokin P.A. described the social structures of society, united by certain values [Sorokin P.A., 1992].and his student, Parsons T., presented a detailed description of the elements of social structures and stable relationships between them [Parsons T., 2000]. Lévi-Strauss K. suggested that the existence of social structures and their functioning is unconscious for a person [Lévi-Strauss K., 2001]. The term "social network" itself was first introduced by sociologist Barnes J.A. in the middle of the XX century and was defined as "branched interrelationships of an individual with other people", and in this context social networks allowed to designate visually complex sets of human relationships [Barnes J.A., 1954]. In the works of Moreno J. social networks were first considered in the framework of the concept of sociometry, which allowed to analyse interpersonal relations in small groups [Gradoselskaya G.V., 2004; Moreno J.L., 1958]. Haider F. made a great contribution to the study of the topic of interpersonal relations within social structures, in which a person acts on the basis of internal attribution (attitudes and character) or external attribution (situation). According to his works, a person creates for himself the least conflict environment for existence and interaction with other people [Heider F., 1958; Ushkin S.G., 2013].

Summarizing the above, from the perspective of sociology, social networks are understood as "a set of social actors and correlations between them, arising on the basis of certain social (kinship, friendship, neighbourhood, professional, etc.) relations and accompanied, as a rule, by the transfer of various kinds of resources (tangible and intangible)" [Gudimenko O.V., Shilova I.M., p. 46].

The redefinition and expansion of the concept of "social networks" can be attributed to the late 1990s, when the first Internet platforms – prototypes of modern social media – appeared in the USA: "Classmates.com", "SixDegrees.com", etc. [Then and now: a history of social networking sites]. The main functions of these sites were to search for former classmates and to use social media as a means of communication. Virtual social connections, having common and different with real forms of interaction, as well as complementing them, opened a new vision for researchers not only in the field of sociology, but also in clinical psychology, social psychology, and psychiatry [Ushkin S.G., 2013]. In the early 2000s, social media were already purposefully created to unite users into virtual communities on the basis of belonging to certain educational institutions [Kuss D., Griffiths M., 2017]. In 2006, the first social media ("Vkontakte" and "Odnoklassniki") appeared in Russia, created to search, unite and communicate with graduates of educational institutions, which contributed to the popularisation of online communication among the most diverse categories of the population [Panchenko I.M., 2018]. At the end of 2022, the social network "Vkontakte" is used by about 73.4 million Russian users, and "Odnoklassniki" – about 40 million. [UDM-info, 2023; VK, 2023]. A broader view of the prevalence of social media use in Russia in recent years is reflected in the Digital Global Overview Report [Digital 2022: The Russian Federation, 2022; Digital 2023: Global Overview Report, 2023]. According to this report, there are about 106 million active social media users in the Russian Federation, which is about 76.7% of the total population of the country. It is important to note that compared to the 2020 report, the number of users increased by 10.8 million people. The majority of users are young people aged 25-34 (women 14.5%, men 12.6%) and a fifth are children, adolescents and young adults aged 12-24 (9.5% young women, 10.0% young men). It is noteworthy that each Russian user has on average about 7 accounts in various social media and/or messengers, and the average time a Russian spends on social media is 2 hours and 28 minutes. According to statistics, 32% of Russian users use social media for work. [Digital 2021 October Global Statshot Report, 2021; Digital 2022: The Russian Federation, 2022; Digital 2023: The Russian Federation, 2023].

Thus, the term "social media" originated in the philosophical and sociological sciences in relation to human relationships in the real world, but the development of digital technologies has allowed this concept to be extended and complemented to the interaction of people in virtual space. To date, the phenomenology of virtual communication has become a subject of study in a wider range of disciplines, including medicine, psychology and education.

The term "social media" ("social networking sites") is defined by foreign experts as "virtual communities where users can create individual public profiles, communicate with real friends and get acquainted with other people on the basis of common interests" [Griffiths M.D., Kuss D.J., Demetrovics Z., 2014, p.119]. Foreign researchers also use the term "social media" – which either appears to be synonymous with "social networking sites" [Bányai F. et al., 2017], or is a broader concept, including in addition to social media, online messenger platforms and can be defined as digital technologies aimed at creating user-generated content or interaction [Carr C.T., Hayes R.A., 2015; European Monitoring Centre for Drugs and Drug Addiction., 2020; Marino C. et al., 2020].

In Russia, the concept of "social media " is more in line with the definition of "social networking sites" and is synonymous with the term "social networks". In our study both terms are used as equivalent (social media, social networks). By social media, we mean Internet platforms that allow registered users to post information about themselves in the form of text, photos or videos, as well as to interact with each other and form social connections [Dictionary Online: Social Networking, 2023].

The functions of social media in the Internet for society include: obtaining and sharing information; interaction and communication, finding new contacts; entertainment; self-expression, including anonymous expression; self-realisation; socialisation and learning [Gerasimova A.A., Kholmogorova A.B., 2018; Malygin V.L., Feklisov K.A., 2011; Panchenko I.M., 2018].

The opportunities that social media offer the modern individual are highly relevant and valuable. It is important to highlight the positive aspects of moderate social media use in terms of learning and development and mental wellbeing.

Recent studies have proven that social media make a meaningful contribution to autobiographical memory functioning: online postings related to personal experiences have a favourable effect on remembering one's own life events [Johnson A.J., Morley E.G., 2021; Wang Q., Lee D., Hou Y., 2017]. Maintaining social media as a form of diary entries has a favourable impact on the self-identity of the individual, their reflective skills [Talarico J. M., 2022].

A number of opportunities provide the use of social media for educational purposes: accessible information (publication of course news in groups); convenience in doing homework and viewing materials; individualisation of the process by studying students' personal profiles, their interests and hobbies; creation of a favourable communicative environment, participation in the discussion of students who are less active in offline classes; increasing motivation, cognitive interest and efficiency through a variety of formats of interaction on social media; and the use of social media in the educational process. [Jessie S. Barrot, 2021; Navolochnaya Y.V., 2019; Solomatina A.G., 2018]. Studies devoted to the study of the positive impact of social media use on learning have revealed an increase in students' initiative, ability to summarise, as well as the development of grammatical and stylistic text design skills [Akai O.M., Tsarevskaya I.V., Zhuravleva N.S., 2018; Shcherbakova I.V., Timashova M.V., 2020]. Studies also note that social media can play a special role to fulfil the goals of intercultural interaction in learning, providing information, transmitting national values, correcting certain cultural stereotypes [Lytras M. et al., 2018; Phyllis B. Ngai, Stephen M. Yoshimura, Fumihiko Doi, 2020; Lyashenko M.S., Mineeva O.A., Povarenkina I.A., 2019].

The role of social media for mental and psychological wellbeing can be reflected in educational projects, for example, that overcome stigmatised (distrustful, frightening or, conversely, romanticising) perceptions of psychiatry and psychology in society. One of the positive examples of such an effective resource on social media is the community "Standard Deviation" (at the moment the audience of the community is about 9 thousand participants), the purpose of which was to create a platform aimed at solving the problem of early diagnosis of mental illness, to combat the stigma of psychiatric diagnoses, to share experiences, interaction, "peer counselling" and psychological support. [Geger

A.E., Geger S.A., 2021; Yen Ch., Valentine E., 2022; Standard Deviation. Popular science educational public Vkontakte. New Opportunities LLCI project]. Researchers note that on social media it is possible to conduct psychotherapeutic interventions, psychoeducation, moderating discussions for patients [Alvarez-Jimenez M. et al., 2014]. Also developing promising areas of work in which social media will be able to contribute to early diagnosis and prevention of mental health disorders by analysing posts, subscriptions, communication style. This possibility is important for recognition of signs of autodestructive and deviant behaviour [Lytras M. et al., 2018; Rozanov V.A., Rakhimkulova A.S., 2016]. It was found that the accuracy of detection of suicide risk group, based on the study of posts on the page of users, as well as their participation in discussions on social media can reach up to 95% [Cao L. et al., 2021].

Researchers have noted the role of social media as a safe place where social support can be provided. Despite the fact that such social support differs from traditional forms of assistance in real life, studies confirm its importance for very different categories of population, including not only adolescents and young people, but also elderly users [Schwartz-Lifshitz M. et al., 2022; Shensa A. et al., 2020; Wu H.-Y., Chiou A.-F., 2020].

We would like to emphasise the importance of social media for the younger generation, which is immersed in virtual space almost from the very beginning of its life. According to the latest media research data, Russian users aged 12 to 17 spend the most time on the Internet (about 5 hours and 54 minutes), the next categories are 18-24 year olds (about 5 hours and 45 minutes) and 25-34 year olds (about 4 hours and 53 minutes), with social media accounting for at least 19% of this time [Mediascope research company – official website]. The motives for the use of social media by adolescents and young people are to maintain and develop social relations, search for information, entertainment and favourable self-presentation [Priporova E.A., Agadullina E.R., 2019].as well as in stabilising emotional state and getting rid of boredom [Stockdale L.A., Coyne S.M., 2020]. For the younger generation, virtual socialisation has a special role, since social media are associated for them with the development of self-consciousness and "image of the Self" [Rubtsova O.V., Poskakalova T.A., Shiryayeva E.I., 2021]. It was highlighted that the main types of adolescent activity on social media are listening to music,

communicating with acquaintances and friends, watching news, photos, films, meeting new people, communicating in groups, participating in online games embedded in social networking platforms. It is noted that among adolescents the strongest motivation is related to social interaction on social media, which act for them as an environment where it is possible to satisfy the need for self-expression, personal autonomy, and security. At the same time, in the presence of hobbies in real life, the volume of adolescents' activity on social media decreases, which may be related to the natural reason for the distribution of their time during the day. It is noteworthy that adolescents who are less interested in online communication and prefer other online activities have a reduced motivation to learn. Probably, unrelated to the leading activity of social media (e.g., watching films, news, photos and pictures), can negatively affect academic performance in adolescence [Fedorov V.V., Mileev I.D., 2015].

Social media as a subject of study not only in sociology and philosophy, but also in pedagogy, psychology, and medicine play a special role for modern society, and the observed dynamics emphasise the expediency of their moderate use. The key functions of social media are to maintain and establish social ties, in the possibility of remote rapid communication in the spheres of professional, educational and interpersonal interaction, which is of great importance for society as a whole and especially for adolescents, whose leading activity is communication with peers [Elkonin B.D., 2004; Obukhova L.F., Shapovalenko I.V., 2013]. Nevertheless, excessive use of social media can lead to a number of unfavourable consequences for the personality in different spheres of life at any age.

## **1.2. Addictogenic potential of social media**

Excessive use of social media can lead to a number of negative consequences, among which are mentioned: a decrease in social, educational, professional activity; limitation of social communication in real life; cognitive impairment; deterioration in the quality and duration of sleep; negative impact on self-esteem, level of pretensions and emotional-volitional sphere of the individual [Andreassen C.S., Pallesen S., Griffiths

M.D., 2017; Baumgartner S. et al., 2018; Graham S. et al., 2021; Awobamise A., Jarrar Y., Nweke G.E., 2022].

A detailed study of the negative aspects associated with the use of social media originates from studies devoted to the problem of excessive use of the Internet. The first references to the phenomenon of Internet addiction appeared in foreign studies of the late XX century in the framework of the study of non-chemical addictive behaviours [Goldberg I., 1996; Griffiths M., 1998; Young K. et al., 1999]. The states and symptoms associated with the nosological units available at that time were described: craving disorders and volitional personality disorders. Predominantly the topic of Internet addiction began to develop in connection with the processes of global computerisation and informatisation in the world, which was reflected in changes in the behaviour of both the individual and the whole society [Shakun E.Y., Lanovaya A.M., Fadeeva E.V., 2022].

With regard to negative personality changes associated with digitalisation, Griffiths M. developed a component model of "technological" addictions characterised by the following criteria: 1) super-valuable attitude to a certain activity, which becomes dominant and is perceived subjectively as the most important in life; this activity begins to dominate in thinking, forming a preoccupation with certain issues and aspects of behaviour and cognitive distortions; there is a hard-to-control attraction (craving) to it, which is inevitably reflected in behaviour; 2) modification (change) of mood can be represented both by excitement (to the level of euphoria) and, on the contrary, by a feeling of deep calmness and satisfaction [Griffiths M., 1998].

In the 2000s, the problem of behavioural addictions attracted the attention of Russian researchers (Korolenko Ts.P., Dmitrieva N.V., Loskutova V.A., Voyskunsky A.E.) in the context of such sciences as psychiatry, narcology and medical psychology. Korolenko Ts.P. and Dmitrieva N.V. in their works raised the problem of "psychosocial addictology", which includes different paradigms: socio-psychological, biomedical, cultural, pedagogical, legal, and in 2001 the authors published the first manual on addictology in Russia [Korolenko Ts.P., Dmitrieva N.V., 2001]. This manual already mentioned "Internet addiction" and described the appeal of the virtual world. Addictive behaviour was described by the authors as "withdrawal from reality by changing the

mental state" [Korolenko C.P., Dmitrieva N.V., 2001 c. 8]. When it is impossible to realise a significant need and experiencing a state of psychological distress, a person can resort not only to the consumption of psychoactive substances, which was described in detail in the concept of violation of the hierarchy of motives in alcohol dependence [Bratus B.S., 1974; Leontiev D.A., 2016], but also to fulfil their desires or get rid of negative experiences by withdrawing into the virtual world of the Internet.

A great contribution to the study of Internet addiction in Russia was made by V.A. Loskutova, a student of Korolenko C.P. She studied the specifics of sociodynamic aspects of the main regularities of the formation and dynamics of the addictive mechanism of Internet addiction, its cultural peculiarities among Russian-speaking Internet users. The obtained data were used to predict the emergence and development of Internet addiction and to draw up programmes for its correction and prevention. The problem of comorbidity of Internet addiction with other mental disorders, both psychiatric and narcological circle, was considered separately [Loskutova V.A., 2005].

Since the 2010s, we can note a number of studies of Internet addictive behaviour devoted to the study of the phenomenon of virtual communication [Malygin V.L. et al., 2011; Voyskunsky A.E., 2015; Egorov A.Y., 2015; Kibitov A.O., Trusova A.V., Egorov A.Y., 2019; Trusova A.V. et al., 2021].

The study of genetic markers of Internet addiction conducted by Trusova A.V., Kibitov A.O. et al. allowed us to present a comprehensive model of Internet addiction, which included a certain genetic and psychological profile of users. According to the data obtained, genetic risk markers were the genes of brain neurotrophic factor BDNF rs6265 (GA+AA) and NTRK3 rs2229910 (GC+CC), and the gene of dopamine receptor type 4 DRD4 48bp (SL+LL) was classified as a protective genetic marker. Psychological risk markers included: impulsive planning (an important factor in the aetiology of addiction diseases that has a high level of genetic control); and self-directedness (the capacity for self-control and self-regulation, which is associated with high levels of satisfaction with self and life). Among additional protective psychological markers for male users only, a childhood psychotraumatic experience (living in a community with a high level of violence) was identified as a situation requiring effective communication in the real



world, rather than in the virtual world. [Kibitov A.O., Trusova A.V., Egorov A.Yu., 2019; Trusova A.V. et al., 2021].

Egorov A.Y. structured symptomatic, clinically significant and temporal criteria of Internet addictive behaviour. The symptomatic criteria of Internet addictive behaviour, by analogy with addiction to psychoactive substances, include: preoccupation with the Internet (memories of use and anticipation); withdrawal symptoms (dysphoria, irritability in the absence of access to the Internet); tolerance (increase in time spent online); unsuccessful attempts to reduce or control Internet use; continuation of Internet use despite negative consequences; loss of interest in previously significant activities; and loss of interest in the Internet. Clinically significant disorder criteria include functional impairment such as decreased social, academic, and occupational functioning, including loss of meaningful relationships, jobs, and educational or career opportunities. Temporal criteria of addictive behaviour include the use of the Internet 6 or more hours a day for at least 3 months [Egorov A.Y., Golenkov A.V., 2005].

Symptomatic manifestations of Internet addiction are based on the relevant criteria of addiction to psychoactive substances. Turning to the general psychopathology of drug addiction diseases, addiction syndrome is defined as "a combination of physiological, behavioural and cognitive phenomena in which the use of psychoactive substances or a class of substances occupies a leading place in the system of values of the patient" [Ivanets N.N. et al., 2020, p.75]. To diagnose addiction, three or more signs are sufficient, which should be observed for at least 12 months: a strong desire (craving) for a psychoactive substance; reduced ability to control the intake of a psychoactive substance, unsuccessful attempts to reduce it; withdrawal state (withdrawal syndrome) that occurs when reducing or stopping the use of a psychoactive substance; increased tolerance to a psychoactive substance; absorption of a psychoactive substance; continued use of a psychoactive substance in spite of obvious signs of addiction. In the context of behavioural addictions, instead of a psychoactive substance as an object of addiction, it is a behavioural pattern (activities on the Internet: online communication, games, shopping, etc.) [Egorov A.Y., 2015].

Perezhogin L.O. indicated mental infantilism as a predictor of the formation of Internet addictive behaviour, which manifests itself in delayed physical, mental and personal development, accompanied by persistent emotional and behavioural disorders leading to maladaptation. To other disorders of mental development associated with dependence on the Internet, the author attributed: attachment disorders, attention deficit hyperactivity disorder (manifested mainly in attention deficit disorder), as well as oppositional defiant behaviour and learning disorders. [Perezhogin L.O., 2020; Perezhogin L.O., Vostroknutov N.V., 2009].

Voiskunsky A.E. noted the similarity between the concept of addiction and the concept of "presence" in relation to Internet behaviour. According to the proposed provisions, the phenomenology of escapism is a common factor both for psychological addiction or withdrawal into another reality, and for the psychology of "presence" or prolonged stay in virtual reality. It is noted that when presence occurs, a person realises the fact of an artificially created situation in which he can experience the illusion of interaction with other subjects [Voyskunsky A.E., 2015].

Scientific and clinical studies of the phenomenon of Internet addictive behaviour have laid the foundation for preventive interventions in relation to this type of behavioural addiction. In particular, Malygin V.L. et al. presented the directions of prevention of Internet addictive behaviour among adolescents, including the development of parental competence, correction of emotional and communicative sphere of adolescents. On the basis of these directions of psychological and psychosocial prevention a psychocorrectional programme was developed [Malygin V.L., Iskandirova A.I., Feklisov K., 2011]. Antonenko A.A., a student of Malygin V.L., – in her PhD thesis considered the problem of Preference for online social interactions within the framework of Internet addictive behaviour, which allowed to formulate the targets of psychological interventions related to the features of the communicative sphere of adolescents [Antonenko A.A., 2014; Malygin V.L. et al., 2014]. Perezhogin L.O. et al. presented methodological recommendations on psychotherapeutic assistance and rehabilitation of minors addicted to the Internet, in which as the main methods of correction are presented:

training in autogenic training in the form of individual work (at least 6 meetings) and group sessions of autogenic training (at least 8 meetings) [Perezhogin L.O. et al., 2022].

The conducted research allowed us to formulate a definition of Internet addictive behaviour, which manifests itself as "excessive insufficiently controlled behaviour related to the use of the Internet, causing harmful consequences and leading to a decrease in the quality of social and personal functioning, as well as to disorders of mental and physical health" [Kibitov A.O., Trusova A.V., Egorov A.Yu., 2019; Trusova A.V. et al., 2021, p.23].

In recent years, there has been an increasing special scientific interest in the problem of addiction formation specifically in relation to the use of social media, often within the study of Internet addictive behaviour, which is the most studied phenomenon in the field of digitalisation and meets the main criteria of addictive behaviour [Andreassen C.S., Pallesen S., Griffiths M.D., 2017; Egorov A.Y., 2020]. The term "problematic social media use" seems to us to be less stigmatising, but indicating the negative consequences of excessive use of social media for human life activity and well-being. This phenomenon is actively researched and reflected in the publications of foreign and Russian authors [Eijnden R.J.J.M. van den, Lemmens J.S., Valkenburg P.M., 2016; Griffiths M.D., Kuss D.J., Demetrovics Z., 2014; Kuss D., Griffiths M., 2017; Sirota N.A. et al., 2018; Sheinov V.P., 2021].

Based on scientific approaches to non-chemical types of addiction Egorov A.Y., Soldatkin V.A., Griffiths M.D., problematic use of social media is understood as behaviour characterised by pronounced and stable signs of addiction, in which the object of addiction is a behavioural pattern in the form of Internet communication activities and (or) online social activity.

Analysis of the studied fundamental, clinical and scientific studies allows us to draw analogies in the pathogenesis of the formation of chemical and non-chemical forms of addictive behaviour, based on similar symptoms and criteria, comorbidity with other mental disorders, which allows us to state the high addictogenic potential of excessive use of social media on the Internet.

### 1.3. Methodology for studying problematic social media use

The methodology for studying problematic social media use is based on many years of research with a significant evidence base, underpinning the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) and the International Classification of Diseases (ICD-11) [American Psychiatric Association, 2013; ICD-11: International Classification of Diseases 11th Revision]. These classifications formulate criteria for mental and behavioural disorders caused by substance use or addictive behaviours, which are analogous to the criteria for problematic social media use.

According to the ICD-11 describing gaming disorder, excessive use of social media as a form of addictive behaviour can be defined based on the following diagnostic criteria:

- impaired control of play behaviour;
- increasing priority of play behaviour over other life interests and daily activities;
- continuation or escalation of play behaviour despite the occurrence of negative consequences [ICD-11: International Classification of Diseases, 11th Revision].
- According to the DSM-5 criteria for gaming disorder, problematic social media use may include:
  - excessive preoccupation;
  - withdrawal symptoms;
  - increasing tolerance;
  - unsuccessful attempts to control gaming behaviour;
  - continued excessive use despite psychosocial problems;
  - deception about the amount of time spent on play activities;
  - using games to avoid negative psycho-emotional states or to reduce their impact (escapism);
  - refusal to engage in other activities;
  - jeopardising or losing a significant relationship, job, or education or career opportunity because of gambling behaviour [American Psychiatric Association, 2013].

Based on the above criteria, Russian researchers apply the following psychodiagnostic tools to study problematic social media use:

- *Problematic Facebook\* Use Scale (PFUS)*, which includes: 1) scales oriented to the ICD-10 criteria ("Cognitive preoccupation", "Compulsive use", "Negative outcomes"); 2) additional scales aimed at studying excessive use of social media ("Preference for online social interactions" and "Mood regulation") [Marino C. et al., 2016; Sirota N.A. et al., 2018].

- *Social Media Disorder Scale (SMD-Scale)*, which includes similar DSM-5 gaming disorder scales [Eijnden R.J.J.M. van den, Lemmens J.S., Valkenburg P.M., 2016; Inchley J. et al., 2020].

In a study devoted to the modification and testing of the PFUS, the authors presented the frequency of problematic social media use among Russian youth. Thus, out of 900 respondents, about 29% were categorised as users with problematic social media use [Sirota N.A. et al., 2018]. Similar results were obtained in our pilot study of problematic social media use among students during the COVID-19 coronavirus infection pandemic [Lanovaya A.M. et al., 2021].

- *SMD-Scale* was used in one of the largest international monitoring projects involving the Russian Federation – Health Behaviour in School-aged Children (HBSC). The results of the study pointed to a number of identified problems characteristic of adolescents 11-15 years: the intensive use of electronic communications, preference of online communication to interpersonal communication with friends and problematic social media use [Inchley J. et al., 2020]. According to the results of the project, intensive use of electronic means of communication was identified among 34% of Russian adolescents, which corresponds to the average indicators of adolescents from other countries who participated in the project (35%). Problematic social media use, which entails a negative impact on various aspects of life, was observed in 8% of Russian adolescents, which is comparable to the results of all participants in the international project. Differences were observed in the Preference for online social interactions over

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\*Owned by Meta Platforms Inc., the activity of the social network is banned in the Russian Federation on the grounds of extremist activity

"live" interpersonal communication, which was observed among 20% of Russian adolescents, while the average value was 14% [Inchley J. et al. [Inchley J. et al., 2020; Lanovaya A.M., Fadeeva E.V., 2021].

In addition to PFUS and SMD-Scale, based on international disease classifiers, other diagnostic tools adapted in the Russian-speaking sample or developed by Russian researchers are also used.

- *Bergen Social Media Addiction Scale (BSMAS)*, adapted by V.A. Rozanov and D.V. Zotova, includes the scales "absorption and constant involvement", "growing tolerance", "impact on mood", "relapse/loss of control", "withdrawal syndrome", "conflict/functional impairment" [Andreassen C.S., Pallesen S., Griffiths M.D., 2017; Zotova D.V., 2020] [Andreassen C.S., Pallesen S., Griffiths M.D., 2017; Zotova D.V., Rozanov V.A., 2020]. Application of this scale among young adults allowed us to identify 11% of respondents with pronounced signs of addiction to social media and 19% of users at risk of forming this form of addictive behaviour [Zotova D.V., Rozanov V.A., 2019].

- *The social network addiction questionnaire* developed by Sheinov V.P. and Devitsyn A.S. in accordance with the three-factor model includes the study of the influence of the following indicators on the formation of addictive behaviour: 1) communicative (adding photos, thinking about going to social media, updating the page); 2) informational (reading news on social media, their subsequent discussion with friends, checking updates on social media ); 3) indicators of the psychological state of the individual (use of social media for care). For this model, the factor "psychological state" prevails in terms of the strength of contribution to the overall indicator of dependence on social media and correlates with anxiety, depression, loneliness, self-esteem and life satisfaction [Sheinov V.P., Devitsyn A.S., 2021b]. The developed questionnaire meets the criteria of validity and reliability and includes 15 questions. According to the results of standardisation, the authors also provided normative values for male and female respondents (the average score for women was  $34 \pm 9$ , for men –  $30 \pm 8$ ), but data on the occurrence of addictive behaviour among the study participants were not provided [Sheinov V.P., Devitsyn A.S., 2021a].

- *Index for self-perceived problems with social media use* was developed for the European School Survey Project on Alcohol and Other Drugs [European School Survey Project on Alcohol and Other Drugs, ESPAD, 2019]. The index included the following indicators: student's perception of problems related to the time of using electronic communications, negative changes in emotional state in a situation of limited access to them, as well as family conflicts related to this problem. It was revealed that, on average, 46% of schoolchildren aged 15-16 who participated in the study were categorised as having a risky level of social network use, which had a negative impact on their emotional state and family relationships. It was noted that the subjective perception of these problems among the adolescents in the described category was not correlated with the amount of time spent on social media, although in most countries girls reported weekend social media use more frequently than boys [ESPAD Report 2019: Results from the European School Survey Project on Alcohol and Other Drugs, 2020].

Based on the above, there is currently a wide range of problematic social network use in Russia: from 8% to 46% among adolescents and from 11% to 30% among young adults, and the highest level of problematic social media use was found among school students aged 15-16 years (Index for self-perceived problems with social media use, 46%). [European Monitoring Centre for Drugs and Drug Addiction., 2020]. The ambiguous prevalence rates of problematic social media use are the result of diagnostic problems and insufficient systematisation of criteria for this type of addictive behaviour [Lanovaya A.M., 2022a]. Accordingly, studies of problematic social media use as a form of addictive behaviour should be based not only on valid tools, but also on a reliable methodology, which will help to identify targets for psychological intervention and prevent the formation of stable signs of addictive behaviour and adverse psychosocial consequences.

#### **1.4. Individual psychological, psycho-emotional and behavioral characteristics of individual associated with problematic social media use**

In recent decades, research has increasingly focused on the psychological characteristics that are associated with and influence problematic social media use.

The study of predictors of the formation of problematic social media use is currently most often considered from the perspective of addictology, emphasising the common biological basis, psychopathology and symptomatology of non-chemical and chemical addictions [Egorov A.Y., Soldatkin V.A.; Egorov A.Y. et al., 2020]. Also in the study of this problem are widespread positions of dispositional psychological theories, suggesting that people with certain characterological features are more prone to the development of addictive behaviours [Sun Y., Zhang Y., 2021]. and concepts of normotypic use of multifunctional Internet technologies [Wang C., Lee M., 2020].

The analysis of available sources has allowed us to identify a number of psychological characteristics of users with problematic social media use, to present recent data revealing the relationship between the state of mental health and the presence of this form of addictive behaviour, and to describe features of deviant (deviant) online behaviour associated with problematic social media use.

### ***Personal sphere and problematic social media use***

A strong protective factor in the formation of problematic social media use in the personal domain is positive family functioning, including a reliable type of attachment to parents, displays of love and care, as well as a sense of basic security [Fumero A. et al., 2018]. Researchers have noted that with a weak type of attachment in real life, social media are used as a compensation for the deficit of warm relationships [D'Arienzo M.C., Boursier V., Griffiths M.D., 2019], and an anxious attachment type characterised by a constant need to seek support and reassurance is a predictor of the formation of problematic social media use [Chang Liu, Jian-Ling Ma, 2019].

As the most significant factor determining personal characteristics in problematic social media use, researchers note the pronounced differences between real and virtual identities. This discrepancy can be manifested in virtual self-presentation of oneself as a person of a different age (both older and younger than the real age), gender, endowed with abilities and competences that are absent in real life or as a literary, cinematographic or game character [Zhichkina A.E., Belinskaya E.P., 2004; Rasina E.O., 2021; Soldatova G.U., Chigarkova S.V., Ilyukhina S.N., 2022].

The following personality disorders may be noted:



- decrease in self-esteem, level of pretensions and perceptions of personal competence due to comparing oneself with other users on social media and non-compliance with certain standards of behaviour and self-presentation in virtual space [Halfmann A., Rieger D., 2019; Kircaburun K. et al., 2020; Frolova K.A., 2020; Sheinov V.P., 2021];
- the formation of narcissistic tendencies, manifested in the desire of the personality to receive recognition and attention on social media, when the user creates an idealised image of himself and seeks constant confirmation of his value and attractiveness [Cataldo I. et al., 2021; Rozanov V.A., Rakhimkulova A.S., 2016].;
- development of intrapersonal conflicts that can arise due to contradictions in self-presentation in the online environment and in real life [Maurya V.P., Patel A.K., Sharma V., 2018; Sun Y., Zhang Y., 2021; Wang C., Lee M., 2020]; [Kholmogorova A.B., Gerasimova A.A., 2019].and also because of dissatisfaction with their own self-realisation due to the focus on virtual reality and lack of satisfaction from real life achievements and interaction with people [Malygin V.L. et al., 2015, 2016; Cargill M., 2019; Danilova A.S., 2020].

### ***Psycho-emotional domain and problematic use of SM***

The most frequently mentioned features of the emotional domain in problematic social media use are high rates of anxiety and stress, as well as difficulties in emotional self-regulation.

Anxiety can be related:

- with the subjective feeling of shortcomings in their appearance when compared with the visual content of other social network users [Boursier V., Gioia Fr., Griffiths M.D., 2020].;
- with the belief that the user may miss out on significant social events or activities and be excluded from the general social context. This behavioural phenomenon is called "Fear of Missing Out Syndrome" (FoMo) (Fear of Missing out, FoMo). [Sheldon P., Antony M.G., Sykes B., 2021; Tandon A. et al., 2021]. A loss of value syndrome related to the fear of missing out on any social media postings or notifications that may play an objectively or illusorily important role for the user's social experience. In some

cases, FoMo syndrome can lead to procrastination [Müller S.M. et al., 2020; Wartberg L., Thomasius R., Paschke K., 2021; Li X., Ye Y., 2022; Lozano-Blasco R., Robres A.Q., Sánchez A.S., 2022, 2022].

In the study of stress indicators in users with problematic social media use noted: higher susceptibility to stressful situations, increased psycho-emotional stress and irritability [Rozanov V.A., Rakhimkulova A.S., 2016; Keles B., McCrae N., Grealish A., 2020; Wartberg L., Thomasius R., Paschke K., 2021].

The dynamic development of digital technologies can cause another psycho-emotional phenomenon defined as technostress. Technostress manifests itself in feelings of anxiety, insecurity, tension in the process of direct use of computer technologies [Maier C. et al., 2019; Sharma B., Lee S.S., Johnson B.K., 2022; Tarafdar M. et al., 2020; Baburin A.V., Fomina N.A., 2021]. Technostress can be caused by a number of factors:

- discomfort due to regular updates and changes in the interface of social media, difficulty in using new functions;
- information overload due to a large amount of information,
- doomscrolling, which is defined as a media habit characterised by constant attention to negative information on social media news feeds, e.g. crises, natural disasters, tragedies.

Technostress can manifest itself in behavioural changes in which the user is forced to adapt to a format of social network use that is comfortable for their interlocutors but not for themselves (including FoMo syndrome), which can lead to emotional exhaustion. Feelings of anxiety as a manifestation of technostress can accompany a person in situations of social communication, when the use of SM may be inappropriate (e.g., at dinner with friends) [Maier C. et al. [Maier C. et al., 2019; Sharma B., Lee S.S., Johnson B.K., 2022; Tarafdar M. et al., 2020]. Subsequently, technostress can lead to emotional rejection and discourage further adoption and use of digital devices and computing technologies.

Studies indicate that people are increasingly attempting to achieve a more favourable psycho-emotional state by using social media [Brailovskaia J., Margraf J., 2020], but this is a low-impact way of avoiding negative experiences and can lead to self-

regulation disorders [Baumgartner S. et al., 2018; Du J., Kerkhof P., Koningsbruggen G.M. van, 2021; Wartberg L., Thomasius R., Paschke K., 2021].

***The volitional domain and problematic use of the social media***

Difficulties in regulating behaviour are a key feature characterising the volitional domain of individuals with problematic social media use. In the context of problematic social media use to a greater extent considered the difficulties of control, which are manifested in the inability to regulate the frequency and duration of use of social media [Du J., Kerkhof P., Koningsbruggen G.M. van, 2021]. often to the detriment of other activities, rest, sleep, and eating. There is also a general decline in the ability to control one's behaviour, including the affective component. This is especially evident in the situation of restricted access to the use of social media [Shlyapnikov V.N., 2021]. Difficulties in control can often lead to disorders of action planning [Baumgartner S. et al., 2018; Nikolaidou M., Fraser D.S., Hinvest N., 2019; Wegmann E., Brand M., 2020], which is also noted by researchers in other types of behavioural addictions [Ioannidis K., Grant J.E., Chamberlain S.R., 2022; Agibalova T.V. et al., 2020].

***Communicative domain and problematic use of social media***

The communication disorders observed in individuals with problematic social media use are closely related to the peculiarities of online communication in modern society. Online communication mediated by digital technologies is characterised by:

- the impossibility of physical contact, of bodily representation;
- limitation of sensory perception channels (written language is predominantly involved);
- specific language of communication (slang, letter combinations) and expression of emotions (emoji, stickers, pictures),
- creation of virtual identity and online self-presentation (selection of name, avatar, gender, age, social status, which do not necessarily correlate with the real characteristics of the user);
- spatial and temporal uniqueness (the significance of geographical distance is lost, there is a state of "online" and "offline") [Rubtsova O.V., 2019].

One of the most pronounced negative features of the communicative domain of users with problematic social media use is the fear of live face-to-face communication [Awobamise A., Jarrar Y., Nweke G.E., 2022]. This feature can manifest itself:

- in the decrease of real social support and increase of support on social media [Meshi D., Ellithorpe M.E., 2021].;
- in the preference for virtual communication, a sense of comfort while maintaining anonymity, which causes a deficit of social relations, social competence skills and reduced ability to establish relationships [Fumero A. et al., 2018].;
- in the decline of communication skills, especially among male users [Larson L., 2021; Sushkov I.R., Kozlova N.S., 2013].;
- in disorders of interpersonal relationships and inadequate social behaviour [Fumero A. et al., 2018; Larson L., 2021; Sushkov I.R., Kozlova N.S., 2013].;
- in the aggressive form of virtual communication as a more accessible way of self-expression online [Sushkov I.R., Kozlova N.S., 2013].

### ***Cognitive domain and problematic use of social media***

Among the cognitive impairments characteristic of users with problematic social media use, the most common are:

- impaired concentration of attention (distractibility type) [Kushlev K., Proulx J., Dunn E.W., 2016; Tkhostov A.Sh., 2018; Du J., Kerkhof P., Koningsbruggen G.M. van, 2019; Wang C., Lee M., 2020; Sheinov V.P., Devitsyn A.S., 2021b; Sheinov V.P., Dyatchik N.V., 2021].;
- Attention bias, increased interest and focus on stimuli related to social media [Nikolaidou M., Fraser D.S., Hinvest N., 2019; Wegmann E., Brand M., 2020].

Distractibility has a negative impact on academic performance, productivity and general well-being, and repeated social media notifications can lead to symptoms of hyperactivity: impatience, anxiety, impaired programming and activity control. The mere presence of a social media device in the workplace is associated with distractibility. However, some studies have noted that distraction by social media notifications that are related to social support or work does not interfere with the main activity, and on the contrary, may improve its quality [Du J., Kerkhof P., Koningsbruggen G.M. van, 2019].

### ***Mental health and problematic social media use***

Despite numerous correlational studies, researchers have highlighted the ambiguous causal correlations between problematic social media use and mental and behavioural disorders, in particular insomnia, stress disorder or mood disorders. It is often unknown whether they are primary or manifest as a consequence of problematic social media use over a long period of time [Boer M. et al., 2021; Lin C.-Y. et al., 2020]. However, there is evidence of poorer mental health in respondents with higher rates of problematic social media use [Lin C. et al., 2021]. It is noted the negative impact of excessive use of SM on the functioning of the limbic system, which can lead to the formation of depression [Perezhogin L. O., 2022]. In particular, the refusal to use social media for a period of even 1 week had a positive effect on the mental health and well-being of users, mainly due to improved sleep quality [Graham S. et al., 2021].

### ***Deviant online internet behaviour and problematic social media use***

Earlier we noted that one of the personality features associated with the signs of problematic social media use is significant differences between real and virtual identities. This feature was also considered in the context of the theoretical study of the phenomenon of deviant online behaviour. In our work problematic social media use is considered as a variant of behavioural addiction, and some studies suggest that signs of addiction correlate with aggressive behaviour on the Internet [Dozortseva E.G., Kiryukhina D.V., 2020; Siddiqui S., Kazmi A.B., Siddiqui U.N., 2021; Cebollero-Salinas A. et al., 2022].

From the point of view of the socio-cognitive orientation in personality theory (A. Bandura, J. Rotter), online behaviour on the Internet is the embodiment of those models that have been established in a person's real life. Based on the theory of social representations (S. Moscovisi), forms of online communication associated with aggression and violence construct social representations that justify and regulate deviant behaviour in social media. Individualisation theories (G. Lebon, T. Postmes, R. Spears) link deviant behaviour in virtual space to the following situational norms of the Internet [Bovina I.B., Dvoryanchikov N.V., 2020].

Based on the assumption that the described behaviour involves an addictive component of problematic social media use, studying the influence of social media

addiction on the formation of deviant online behaviour may be a promising research direction for future research.

At present, psychometric methods of studying addiction to social media are included in the system of risk assessment of deviant online behaviour [Bogdanovich N.V., Delibalt V.V., 2020a, 2020b; Dozortseva E.G., Kiryukhina D.V., 2020].

The topic of deviant online behaviour, as well as problematic use of SM, is closely related to the tasks aimed at the formation of digital literacy among the population and, in particular, vulnerable groups, including children and adolescents. Psychological prevention of negative online phenomena can be aimed at: developing norms and rules of behaviour in the digital environment; setting time limits for the use of digital devices; education about possible risks when using social media and the Internet; development of models of help on social media; training in ways of self-support [Bogdanovich N.V., Delibalt V.V., 2020a; Dozortseva E.G., Kiryukhina D.V., 2020; Nutskova E.V., Dozortseva E.G., 2022].

To summarise the above, in this paragraph we have presented the personality characteristics interrelated with problematic social media use, including mental well-being and deviant online behaviour. In the personal domain, PSMU can be caused by a discrepancy in perceptions of life in the real and virtual worlds, which is observed in lower self-esteem and the development of intrapersonal conflicts. In the emotional domain at problematic social media use there are increased anxiety, syndrome of lost profit, psycho-emotional tension, technostress, as well as difficulties in emotional self-regulation. In the volitional domain, violations of regulation are predominantly observed, in the communicative domain – fear of live communication. Cognitive interrelated features with this form of behaviour are decreased attention concentration and distractibility. Further research is needed to investigate the causal relationships between PSMU and individual psychological and psycho-emotional personality traits, as well as signs of mental disorders. It should be noted that recent data presenting the characteristics of deviant online behaviour point to the relationship between problematic social media use and deviant and aggressive social media behaviour.

The presented personal and behavioural characteristics of users with PSMU are not always applicable to people who actively use social media in professional or educational activities. In this context, social media can serve as an important tool for communication, information exchange and networking, and their use is justified by the achievement of certain career, educational goals.

### **1.5. Features of problematic social media use in adolescence**

Adolescence is the most vulnerable period to the formation of addictive forms of behaviour, including behavioural addictions [Vlasova N.V., 2021].

The qualitative transformation of mental functions plays an important role: there is a development of intelligence, the parameters of perception, memory, thinking pass to a higher level [Shapovalenko I.V., 2009]. The assimilation of moral and ethical principles and moral values takes place. Fundamental changes in the motivational domain are observed: the mechanism of formation of motives is based on a consciously set goal and accepted intention, and the content of motives reflects the emerging worldview of adolescents, plans for future life [Obukhova L.F., Shapovalenko I.V., 2013].

The sense of adulthood, the development of self-awareness and reflection, and the leading activity is communication with peers are the new formations for this period [Elkonin B.D., 2004]. The main task for the teenager is to find his place among the reference group and self-presentation, and relations with adults are formed in the format of co-operation. Conformity during this period is a risk factor for behavioural deviations, including chemical and non-chemical addictions and other adaptation disorders. Mental development of adolescents is associated with the formation of the ability to solve problems with the help of constructive (overcoming difficulties leads to an increase in the ability to respond) or non-constructive strategies (leaving the problem with the help of attempts at self-soothing, which gives only an illusory result) [Obukhova L.F., Shapovalenko I.V., 2013].

A number of age-related characteristics, such as susceptibility to conformity, non-constructive coping strategies, and a particular need for self-presentation and reference group affiliation, are closely associated with signs of problematic social media use.

From the individual-psychological and psycho-emotional features noted earlier, the following behavioural patterns and negative consequences of SM use are characteristic of adolescence:

- the need to keep track of new content on social media and the construction of a special social virtual reality strengthens the motives for the use of social media among adolescents [Throuvala M.A. et al., 2019].;
- values aimed at establishing and maintaining social relationships are associated with more pronounced signs of addictive behaviour in relation to interaction in the network [Bogdanovskaya I.M. et al., 2021].;
- nighttime adolescents' loss-of-benefit syndrome is related to anxiety about possible negative consequences for real-life relationships, such as the risk of being excluded from offline activities, as well as fear of disapproval by a peer reference group due to violation of norms regarding continuous online accessibility and instant responses to incoming notifications [Fabris M.A. et al, 2020; Scott H., Biello S.M., Woods H.C2019].;
- negative impact on cognitive performance: prolonged social networking in adolescence is associated with increased distractibility [Siebers T. et al., 2022].

### **1.6. Gender features of problematic social media use**

In addition to the age-specific features of social media use characteristic of adolescence, gender-specific differences in problematic social media use can be noted.

The study of gender differences in problematic social media use in Russian studies is predominantly presented in the context of the broader concept of Internet addiction. It was found that among girls with Internet addictive behaviour, the rates of withdrawal symptoms when it is impossible to access Internet services are higher than among boys [Trusova A.V. et al., 2020a]. The female group also showed higher rates of compulsive internet use with decreased communication abilities. Among young adults, differences in the specificity of Internet activities are emphasised, where the male sample is more characterised by participation in multiplayer online games, and the female sample – by the use of social media [Ponizovsky P.A. et al., 2021].



The Preference for online social interactions among men is significantly associated with the desire for acceptance, while in the group of women – with the fear of rejection. Girls are more characterised by self-presentation and communication in networks, and adolescent boys more often avoid real contacts [Kazarinova E.Y., Kholmogorova A.B., 2021].

In Russian empirical studies on problematic social media use, this behaviour is more often observed among women [P.A. Ponizovsky et al., 2021; V.P. Sheinov, A.S. Devitsyn, 2021a]. In foreign studies, the data on the differences between women and men in the manifestation of addictive behaviour are contradictory and do not have a clear trend: in particular, some studies report a higher prevalence of the use of social media among older users and men in other works found a higher prevalence of addiction to social media among young people and especially among women [Rozanov V.A., Rakhimkulova A.S., 2016].

A number of studies point to the special vulnerability of women to the formation of dependence on the Internet and the use of social media [Abbasi I., Drouin M., 2019; Andreassen C.S. et al., 2016; Zotova D.V., Rozanov V.A., 2020; Sheinov V.P., Devitsyn A.S., 2021a]. Greater involvement of women in the use of social media can be explained by the propensity to such activities that include social interaction and co-operation [Andreassen C.S. et al., 2016].

The works of foreign authors, devoted to the study of problematic social media use taking into account gender differences, note the following features:

- adolescent girls are significantly more likely to be at risk of problematic social media use than boys [Paakkari L. et al., 2021];
- girls with problematic social media use were more characterised than boys by low life satisfaction, sleep problems and lower levels of physical activity [Buda G. et al., 2021].;
- girls with problematic social media use have a higher vulnerability to negative self-image formation [Cataldo I. et al., 2021];
- girls are characterised by a less pronounced relationship between problematic social media use and self-esteem indicators [Huang C., 2022];

- higher rates of social media addiction in women characterised by psychopathic personality traits, narcissism and Machiavellianism [Chung K.L. et al., 2019];

- women with a high levels of neuroticism (tendency to experience negative emotions, especially in stressful situations) have much stronger correlations with indicators of problematic social media use than women with lower levels of neuroticism and than men in general [Abbasi I., Drouin M., 2019].

This topic remains an extremely important area of research to identify vulnerabilities to the formation of this type of addictive behaviour among male and female users.

## **Main results and conclusions**

The first chapter presents the theoretical and methodological aspects of studying problematic social media use in the context of modern ideas about behavioural addictions.

The first paragraph analyses the synonymous concepts of "social media" and "social networks", which are defined as internet platforms that allow registered users to post information about themselves in the form of text, photos or videos, as well as to interact with each other and establish social ties. The use of social media enables long-distance communication, meeting and connecting with new people, learning about news, receiving support from other users and improving emotional well-being. This highlights the significant role of social media and the potential for virtual user interaction in modern society.

The second paragraph reveals the problem of high addictogenic potential of the use of social media. The definition of problematic use of social media, characterised by pronounced and stable signs of addiction, in which the object of addiction is a behavioural pattern in the form of Internet communication activity and (or) online social activity. The potential for addiction to social media is high due to the common pathogenesis of the formation of chemical and non-chemical forms of addictive behaviour, based on similar symptoms, criteria, and comorbidity with other mental disorders [Lanovaya A.M., Fadeeva E.V., 2022b].

The third paragraph presents the criteria for differential diagnosis of problematic social media use, which are based on the ICD and DSM classifications, which have a number of differences. The available data on the prevalence of problematic social media use in Russia are presented. It is noted that the diagnostic difficulties are caused by the insufficient number of validated Russian tools and adapted foreign methods, lack of consideration of the duration and purposes of social media use, use of non-standardised questionnaires, which lead to contradictory results regarding the prevalence and severity of signs of this type of addictive behaviour [Lanovaya A.M., 2022a; Lanovaya A.M., Fadeeva E.V., 2021; Shakun E.YU., Lanovaya A.M., Fadeeva E.V., 2022].

The fourth paragraph is devoted to the analysis of individual-psychological, psycho-emotional and behavioural features of personality associated with problematic social media use. The results of the conducted research allowed us to establish that problematic social media use is associated with: 1) peculiarities of the personal domain due to the expressed differences of real and virtual identity of users; 2) peculiarities of the emotional domain, expressed in the increase of anxiety, psycho-emotional tension, lost profit syndrome and technostress; 3) peculiarities of the volitional domain, manifested in the difficulties of regulation; 4) peculiarities of the communicative domain, associated with the characteristics of online communication 5) peculiarities of the cognitive domain, mainly with attention disorders. The presence of interrelations between some signs of mental disorders and PSMU is noted: reliable correlations were revealed with symptoms of depression, bipolar and obsessive-compulsive disorders, sleep disorders. The topic of problematic social media use was also considered in the context of deviant online behaviour on the Internet.

The fifth paragraph highlights the significance of adolescence as a crucial period that demands attention due to the heightened risk of addictive behaviour and its potential impact on mental health.

The sixth paragraph presents the gender aspects of problematic social media use. Mental health professionals and researchers of this problem emphasise that the most vulnerable categories of the population with regard to problematic use of social media are women.

## **CHAPTER 2. ORGANIZATION, MATERIALS AND METHODS OF RESEARCH**

### **2.1. Organization and stages of the study**

The study of problematic social media use among adolescents was conducted in 2021-2022 on the basis of a cooperation agreement between the Federal State Budgetary Institution "V.Serbsky National Medical Research Centre for Psychiatry and Narcology", Russian Federation Ministry of Health and the State Budgetary Institution of Health of the Moscow Region "Moscow Regional Clinical Narcological Dispensary" (MRCD).

The bases of the study were educational institutions of the Moscow region, including seven secondary comprehensive schools (40.7%), two gymnasiums (21.2%), two lyceums (15.6%), and two colleges (22.4%).

Psychological diagnostics were conducted through an online survey, which school students completed during school hours in the presence of the researcher and a representative of the educational organization. Prior to the diagnostics, students provided informed consent to participate in the study.

Inclusion criteria were: age 15-17 years; personal use of a digital device with Internet access (smartphone, tablet, laptop, computer); use of social media in the last 12 months; full-time education in educational organisations; informed consent. Exclusion criteria were: age 14 and younger; age 18 and older; other forms of education in educational organisations or education outside educational organisations; absence of informed consent.

In 2021, the first stage of the empirical study aimed to explore the characteristics of problematic social media use. The online survey took 15 to 20 minutes, and feedback was provided upon individual request of the study participants. A total of 633 school students were surveyed at this stage.

The second stage of the empirical study was conducted in 2022 and aimed to investigate the motivational, semantic and psycho-emotional personality domains of adolescents with different levels of problematic social media use. The online survey lasted between 25 to 30 minutes. After completing the online survey, school students were

provided with an interpretation of the results and the researcher's contact information for necessary explanations or psychological counselling. A total of 90 students were surveyed at this stage (Table 1).

Table 1 – Study Organisational Chart

Research stage	Educational organisations	Number of students
Exploring problematic social media use (Stage I)	Korolev Municipal District: Gymnasium No. 9; Gymnasium No. 13; L.P. Danilina Gymnasium No. 3; Lyceum No. 4; Secondary General Education School No. 12; Secondary General Education School No. 3  Shchelkovo Municipal District: Y.A. Gagarin Lyceum No. 14; Shchelkovo College; Medvezhye-Ozyorskaya Secondary General Education School No. 19; Shchelkovo Secondary General Education School No. 10 with Advanced Study of Individual Subjects; I.A. Kopylov Secondary General Education School No. 25; Shchelkovo College; Shchelkovo College State Professional Educational Institution  Odintsovo Municipal District: A.S. Popov School	633
Study of motivational, semantic and psycho-emotional spheres of personality of adolescents with different levels of expression of signs of problematic social media use (Stage II)	Korolev MBOU Gymnasium No. 3 named after L.P. Danilina	90

The study was approved at the Meeting of the Clinical Section of the Ethics Committee at the V.Serbsky National Medical Research Centre for Psychiatry and Narcology" Russian Federation Ministry of Health, (Protocol No. 3612 dated 6 December 2021). Participation in the study was voluntary and confidential. Each student was assigned a numerical code to identify personal results if necessary for individual psychological counselling. The psychologist and other interested employees of the educational organisation received the results in a summarised form by class.

## 2.2. Sample characteristics

At both stages of the study, 723 school students (402 boys and 321 girls) aged 15 to 17 ( $M=15.4$ ,  $SD=0.7$ ) from educational institutions in the Moscow region participated in psychodiagnostic measures. The sample was gender-balanced, with boys comprising 55.6% of the participants and girls comprising 44.4%.

In the first stage of the study, which aimed to investigate the characteristics of problematic social media use, an online survey was completed by 633 adolescents, comprising 358 males (56.6%) and 275 females (43.4%).

At the second stage, aimed at studying the motivational, semantic and psycho-emotional spheres of personality of adolescents with different levels of expression of problematic social media use, 90 school students, including 44 (48.9%) boys and 46 (51.1%) girls, completed an online survey.

The final data analysis excluded the diagnostic results of 76 school students under 14 years of age and 10 students over 18 years of age as they did not meet the inclusion criteria.

## 2.3. Research methods

The following methods were used in the study:

1) *Theoretical and methodological method included the analysis of scientific sources on the research problem.*

2) *Empirical methods of research: experimental-psychological research, including a number of techniques.*

Stage I. The characteristics of problematic social media use were studied using the following psychodiagnostics:

1. Problematic Facebook\* Use Scale – PFUS [Marino C. et al., 2016]. Modification: Sirota N.A., Moskovchenko D.V., Yaltonsky V.M., Yaltonskaya A.V., 2018 [Sirota N.A. et al., 2018].

The aim was to explore the characteristics of problematic social media use.

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\* Owned by Meta Platforms Inc., the activity of the social network is banned in the Russian Federation on the grounds of extremist activity

The scale includes 15 statements rated by respondents from 1 (Strongly Disagree) to 7 (Strongly Agree). The following scales are presented: "Preference for online social interactions" (items 1-3), "Mood regulation" (items 4-6), "Cognitive preoccupation" (items 7-9), "Compulsive use" (items 10-12) and "Negative outcomes" (items 13-15) related to the use of social media [Sirota N.A. et al., 2018]. The total score is calculated. Normative intervals for the total score were calculated at the first stage of the study: minimal risk of problematic social media use – from 0 to 19 points; propensity to problematic social media use – from 20 to 64 points; problematic social media use – over 65 points.

2. Social Media Disorder Scale – SMD-Scale [Eijnden R.J.J.J.M. van den, Lemmens J.S., Valkenburg P.M., 2016]. The Russian-language version of the scale adapted for the international monitoring project Health Behaviour in School-Aged Children (HBSC) "Health Behaviour of School-Aged Children" was used [Inchley J. et al., 2020].

The aim was to assess the signs of addictive behaviour when using social media.

The scale includes 9 statements related to social media use in the past 12 months and "Yes" and "No" response options. Each statement correlates with a different scale: "Excessive preoccupation" (item 1), "Increased tolerance" (item 2), "Negative withdrawal symptoms" (item 3), "Unsuccessful control" (item 4), "Withdrawal from other activities" (item 5), "Continuation despite consequences" (item 6), "Deception" (item 7), "Escape from reality" (item 8), "Negative outcomes" (item 9). The total score is calculated: 6 or more points indicate problematic social media use [Inchley J. et al., 2020].

3. Assessment of Social Media Usage Duration Scale – ASMUDS [Lanovaya A.M. et al., 2021].

The aim was to evaluate of quantitative parameters of social media use.

The scale includes questions on the duration of social media use on weekends and weekdays, for business and educational purposes. Study participants were asked to objectify their perceived time of social media use using smartphone system settings (screen time).



4. Chen Internet Addiction Scale – CIAS [Chen S.-H. et al., 2003]. Adaptation: Malygin V.L., Feklisov K.A. [Malygin V.L., Feklisov K.A., 2011]. Validation: Trusova A.V., Shumskaya D.S., Kibitov A.O. [Trusova A.V., Shumskaya D.S., Kibitov A.O., 2021].

The aim was to study the peculiarities of Internet addictive behaviour and to assess the level of Internet addiction.

The scale includes 26 questions with four response options (Likert scale). The scales are: "Interpersonal and health problems" (items 5, 7, 12, 13, 15, 17, 21, 24); "Withdrawal symptoms" (items 2, 4, 10, 16, 20); "Tolerance and compulsive symptoms" (items 1, 3, 6, 9, 11, 14, 19, 22); "Time management problems" (items 8, 18, 23, 25, 26). Normative intervals for the total score of the scale: 26-31 points – minimal risk of developing Internet addiction; 32-64 points – propensity to Internet addiction; 65 points and more – a stable pattern of Internet addictive behaviour. [Trusova A.V., Shumskaya D.S., Kibitov A.O., 2021].

Stage II. The study of motivational, semantic and psycho-emotional spheres of personality of adolescents with different levels of expression of problematic social media use was carried out with the help of the following psychodiagnostics:

1. Problematic Facebook\* Use Scale – PFUS [Marino C. et al., 2016]. Modification: Sirota N.A., Moskovchenko D.V., Yaltonsky V.M., Yaltonskaya A.V. [Sirota N.A. et al., 2018].

2. Purpose-in-Life Test – PIL [Crumbaugh J., Maholick L., 1981]. Adaptation: Leontiev D.A. [Leontiev D.A., 2006].

The aim was to study the perceptions of individuals about the factors of meaningfulness of their own lives.

The test includes 20 opposing statements presented with answer options for respondents in the form of a series: "3 2 1 0 1 2 3", where numbers correlate with the confidence of choosing between two statements. During processing the numerical series

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\* Owned by Meta Platforms Inc., the activity of the social network is banned in the Russian Federation on the grounds of extremist activity

is translated into ascending scale "1 2 3 4 5 6 7" (items 1, 3, 4, 8, 9, 11, 12, 16, 17) and into descending scale "7 6 5 4 3 3 2 1" (items 2, 5, 6, 7, 10, 13, 14, 15, 18, 19, 20).

The following scales are presented: General scale (items 1-20); "Goals in life" (items 3, 4, 10, 16, 17, 18); "Life process or interest and emotional intensity of life" (items 1, 2, 4, 5, 7, 9); "Life performance or satisfaction with self-realisation" (items 8, 9, 10, 12, 20); "Locus of control-I (I am the master of life)" (items 1, 15, 16, 16, 18); "Life process or interest and emotional intensity of life" (items 1, 2, 4, 5, 7, 9). 8, 9, 10, 12, 20); "Locus of Control-I (I am the master of life)" (pp. 1, 15, 16, 19); "Locus of Control-Life, or controllability of life" (pp. 7, 10, 11, 14, 18, 19).

3. Relationship Colour Test – RCT [Bazhin E.F., Etkind A.M., 1985]. In the variant of psychosemantic methodology by Dozortseva E.G. [Dozortseva E.G., 2004]. Modification.

The aim is to represent the meaning domain by describing the person's internal attitude towards the structural and content characteristics used.

The test procedure is a colour-associative experiment including 73 concepts belonging to different categories: self-identification ("I am myself", "I am what I would like to be", etc.); time ("Past", "Future", etc.); emotional and ethical categories ("Kindness", "Honesty", "Happiness", "Hate", etc.); categories related to the use of social media ("I am on social media ", "I am how I am seen on social media ", "News feed on social media ", "Communication on social media ", "Communication on social media ", etc.); categories related to the use of social media ("Me on social media ", "Me as I am seen on social media ", "News feed on social media ", "Communication on social media ", "Posting photos on social media ").

4. Depression Anxiety and Stress Scale – DASS-21 [Lovibond P.F., Lovibond S.H., 1995]. Adaptation: Ruzhenkova V.V., Ruzhenkov V.A., Khamaskaya I.S. [Ruzhenkova V.V., Ruzhenkov V.A., Khamaskaya I.S., 2019].

The aim was to screen-diagnose depression, anxiety and stress.

The scale includes 21 questions with four response options (Likert scale). The following scales are presented: "Depression" (items 3, 5, 10, 13, 16, 17, 21), "Anxiety" (items 2, 4, 7, 9, 15, 19, 20), "Stress" (items 1, 6, 8, 11, 12, 14, 18).

Levels of severity are presented for each scale. Depression: Normal level (0-4 points); Moderate level (5-6 points); Medium level (7-10 points); Severe level (11-13 points); Extremely severe level (14+ points). Anxiety: (0-3 points); Moderate level (4-5 points); Medium level (6-7 points); Severe level (8-9 points); Extreme level (10+ points). Stress: Normal level (0-7 points); Moderate level (8-9 points); Medium level (10-12 points); Severe level (13-16 points); Extreme level (17+ points).

5. Emotional Empathic Tendency Scale – EETS [Mehrabian A., Epstein N., 1972]. Adaptation: Orlov Y.M., Emelyanov Y.N. [Orlov YU.M., Emel'yanov YU.N., 1986].

The aim was to analyse the general empathic qualities of the test subject, the level of expression of the ability to respond emotionally to the experiences of another and the degree of correspondence and inconsistency of the sign of the experiences of the object and subject of empathy.

The scale includes 25 questions with four response options (Likert scale). Based on the original version of the questionnaire, the following scales can be distinguished: "Exposure to emotional contagion" (items 8, 15); "Emotional sensitivity" (item 6); "Understanding and respecting other people's feelings" (item 21); "Emotional response to other people's emotional experience" (items 10, 11, 16); "Willingness to get involved in other people's problems" (item 9); "Empathy" (items 19, 25); "General index of emotional empathy" (items 19, 25); "General index of emotional empathy" (items 19, 25); "General index of emotional empathy" (items 19, 25). (p. 19, 25); "General index of the ability to emotional empathy". On the basis of the general index the levels of empathy are presented: 82-90 points – very high level; 63-81 points – high level; 37-62 points – normal level; 36-12 points – low level; 11 points and less – very low level.

### *3) Methods of mathematical statistics.*

Quantitative and qualitative analysis of the obtained data was carried out using methods of mathematical statistics in IBM SPSS-Statistics 26. The significance level of  $p \leq 0.05$  was accepted as the criterion of statistical reliability. The following methods were used:

- a) descriptive statistics;
- b) calculation of frequency tables;

c) conjugacy tables and chi-square test to highlight the frequency of occurrence of a trait;

d) Mann-Whitney test for independent samples;

e) Spearman's criterion for correlation analysis;

e) to determine the structural conditionality of the PSMU, the structurogram method was used to reveal the determination of the PSMU by studying the individual interrelations of personality characteristics and signs of the PSMU;

g) two-stage cluster analysis (Akaike's Information Criterion, Log-likelihood test) was used to identify significantly different groups according to the PFUS;

h) hierarchical cluster analysis (Ward's method) was used to identify meaning complexes using the Relationship Colour Test;

i) linear regression analysis to identify predictors of problematic use of social networks (stepwise regression method), based on the correlation analysis previously conducted to identify independent variables.

The PFUS results were determined based on the total score, standard deviation and z-scores. Minimal risk of problematic social media use correlated with values up to  $-1\sigma$  (0 to 19 points); propensity to problematic social media use correlated with values between  $-1\sigma$  and  $1\sigma$  (20 to 64 points); problematic social media use correlated with values between  $1\sigma$  and more (over 65 points).

Chi-square test was applied: to identify significant differences in the frequency of occurrence of the factor of prolonged use of social media during school days and weekends (6 or more hours) by adolescents with different severity of problematic social media use; to identify significant differences in the frequency of occurrence of positive responses on the SMD-Scale.

Two-stage cluster analysis (Akaike's Information Criterion, Log-likelihood, silhouette measure of cohesion – 0.5, which corresponds to the average quality of cluster separation) was used to identify reliably different groups according to the questionnaire "Problematic social media use". Two groups were identified: Group A – school students who scored higher on the PFUS and were characterised by problematic social media use

(68.9%, 62 people) and Group B – school students with minimally expressed signs of problematic social media use (31.1%, 28 people).

Mann-Whitney test was used to identify differences between the selected groups according to the results of cluster analysis to compare the data of the scales "Depression, Anxiety, and Stress Scale", "Purpose-in-Life Test", "Emotional Empathic Tendency Scale".

Spearman's criterion was used to identify correlations of the final indicator, as well as the scales of the questionnaire "Problematic social media use" with the indicators of the methods "Depression, Anxiety, and Stress Scale", "Emotional Empathic Tendency Scale" and "Purpose-in-Life Test". The data were tested for normality of distribution.

The Spearman's rank correlation coefficient ( $r$ ) was also used to process the data for the Colour Attitude Test to investigate the correlation tribes of concepts.

Linear regression analysis (stepwise regression method) was applied to identify predictors of problematic social media use, based on a preliminary correlation analysis to identify independent variables. Two models were presented: multiple regression (for variables reflecting personality traits and duration of social media use) and univariate (for the psycho-emotional state variable). The quality of the models was assessed: 1) variables were entered, the strength of correlations between which was  $<0.7$  to avoid multicollinearity, collinearity statistics corresponded to acceptable values (Tolerance  $>0.2$ , VIF  $<0.5$ ); 2) there were no outliers; the data of standardised predicted values and standardised residuals corresponded to values from -3 to 3, and their distribution was normal according to the Kolmogorov-Smirnov criterion; 3) there was no autocorrelation (Durbin-Watson criterion statistics corresponded to values of 2.021 and 2.303).

## **Main results and conclusions**

The second Chapter "Organisation, Materials and Methods of the Study" presents the organisational chart of the study stages, the characteristics of the sample, the methods used.

The first and second paragraphs describe the stages of the empirical study and information about the sample. A total of 726 school students (403 boys and 323 girls) of educational institutions of the Moscow region aged 15 to 17 years ( $M=15.4$ ,  $SD=0.7$ ) took part in psychodiagnostic measures. In the first stage of the study (Stage I), aimed at studying the peculiarities of problematic social media use, 633 school students took part. In the second stage of the study (Stage II), aimed at studying the motivational, semantic and psycho-emotional spheres of personality of adolescents with different levels of expression of problematic social media use, 90 school students took part [Lanovaya A.M., 2023, 2022b, 2022c; Lanovaya A.M., Fadeeva E.V., 2022a, 2022b].

The third paragraph presents the main methods of the study:

1) theoretical and methodological analysis of scientific sources on the research problem;

2) experimental-psychological research, including a number of psychodiagnostic techniques aimed at studying the features of problematic social media use (at the Stage I) and at identifying the features of motivational, semantic and psycho-emotional spheres of personality of adolescents with different levels of expression of problematic social media use (at the Stage II);

3) methods of mathematical statistics: descriptive statistics; conjugation tables and chi-square test; comparison of groups using Mann-Whitney U-criterion for independent samples; Spearman's rank correlation coefficient, including correlation analysis-based structural diagrams of PSMU; two-stage and hierarchical cluster analysis; linear regression analysis.

### CHAPTER 3. RESULTS OF THE EMPIRICAL STUDY

The study was conducted in two stages (Table 2).

The first stage (Stage I) aimed to investigate the characteristics of problematic social media use and involved 633 school students. The following methods were used: Problematic Facebook\* Use Scale (PFUS); Social Media Disorder Scale (SMD-Scale); Assessment of Social Media Usage Duration Scale (ASMUDS); Chen Internet Addiction Scale (CIAS).

The second stage of the study (Stage II) was aimed at studying the motivational, semantic and psycho-emotional spheres of the personality of adolescents with different levels of expression of problematic social media use. 90 school students took part in the second stage. The following methods were used: Emotional Empathic Tendency Scale (EETS); Purpose-in-Life Test (PIL); Relationship Colour Test (RCT); Depression, Anxiety, and Stress Scale (DASS-21).

Table 2 – Empirical stages of the study

Research stage	Number of students	Groups studied	Criteria for selecting groups
Study on problematic social media use (Stage I)	633	Whole sample	Total score on the PFUS
		A) Group with minimal risk of PSMU (6.3%; 42 people); B) Group with a tendency to PSMU (83.4%; 553 people); C) Group with PSMU (5.7%; 38 people)	z-scores and standard deviation from PFUS results
Study of motivational, semantic and psycho-emotional spheres of personality of adolescents with different levels of expression of signs of problematic social media use (Stage II)	90	A) Group with pronounced signs of PSMU (69%, 62 people); B) Group with minimal expression of signs of PSMU (31%, 28 people)	Cluster analysis based on the results of the PFUS

\* Owned by Meta Platforms Inc., the activity of the social network is banned in the Russian Federation on the grounds of extremist activity

### 3.1. Exploring patterns of problematic social media use among adolescents (Stage I)

In the first stage of the study (Stage I), the empirical data were analysed among the whole sample as well as in three groups identified using a method based on z-scores and standard deviations:

A) The group with minimal risk of PSMU, which included 42 (6.6%) school students, of which 35 (83.3%) were males and 7 (16.7%) were females;

B) The group with tendency to PSMU, which included 553 (83.4%) school students, of which 308 (55.7%) were males and 245 (44.3%) were females;

C) The group with PSMU, which included 38 (6.0%) school students, of which 15 (39.4%) were males and 23 (60.5%) were females.

The duration of social media use was analysed in the identified groups using the results of the Assessment of Social Media Usage Duration Scale. It was found that 7.1% of adolescents at minimal risk of problematic use of social media were characterised by prolonged use (6 or more hours) on school days and weekends. Significantly more adolescents in the group with a propensity for problematic social media use spent long periods of time using them: 12.6% on school days and 22.0% on weekends. For the group of adolescents with problematic social media use, the duration of use for 6 or more hours was even more common: for 44.7% on school days and 63.2% on weekends (Table 3).

Table 3 – Comparative analysis of the severity of problematic social media use compared to the duration of their use during school days and weekends (PFUS and ASMUDS, n=237)

Expression of problematic social media use	6 hours or more	
	on a school day*** n=88	on a weekend day n=149
Minimal risk	3 (7,1%)	3 (7,1%)
Tendency to problematic use	68 (12,3%)	122 (22,0%)



Problematic use	17 (44,7%)	24 (63,2%)
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Note: \*\*\* – statistical significance  $p < 0.001$

Thus, it was found that prolonged use of social media (6 or more hours) was significantly more common ( $p < 0.001$ ) among adolescents with problematic social media use during both school days and weekends.

Based on the empirical data obtained, the following analysis was carried out: 1) the correlation between the expression of problematic social media use and Internet addictive behaviour among adolescents; 2) gender features of problematic social media use [Lanovaya A.M., Fadeeva E.V., 2022b].

### **3.1.1. Problematic social media use and Internet addictive behaviour among adolescents**

According to the results of the conducted theoretical and methodological analysis, problematic social media use can be considered as one of the forms of Internet addiction, in this regard, we conducted a correlation analysis of the signs and study of the ratio of the expression of these types of addictive behaviour.

The correlation analysis revealed significant correlations between all signs of problematic social media use and signs of Internet addictive behaviour (Table 4). In particular, the strongest correlations were observed between the overall index of problematic social media use and the index of Internet addiction ( $r = 0.670$ ,  $p \leq 0.001$ ), including withdrawal symptoms ( $r = 0.632$ ,  $p \leq 0.001$ ), symptoms of increased tolerance and compulsive symptoms during its use ( $r = 0.618$ ,  $p \leq 0.001$ ). There were also fairly high correlations of cognitive preoccupation with social media with withdrawal symptoms due to discontinuation of internet use ( $r = 0.630$ ,  $p \leq 0.001$ ) and compulsive use of social media with internet addictive behaviour ( $r = 0.620$ ,  $p \leq 0.001$ ).

Table 4 – Intercorrelation of signs of problematic social media use and Internet addictive behaviour among adolescents (PFUS and CIAS, n=633)

	<b>PFUS Total score</b>	<b>Preference for online social interaction</b>	<b>Mood regulation</b>	<b>Cognitive preoc- cupation</b>	<b>Compul- sive use</b>	<b>Negative outcomes</b>
CIAS Total score	<b>0,670***</b>	<b>0,289***</b>	<b>0,459***</b>	<b>0,607***</b>	<b>0,620***</b>	<b>0,429***</b>
Interpersonal and health problems	<b>0,591***</b>	<b>0,288***</b>	<b>0,412***</b>	<b>0,470***</b>	<b>0,530***</b>	<b>0,467***</b>
Withdrawal symptoms	<b>0,632***</b>	<b>0,281***</b>	<b>0,443***</b>	<b>0,630***</b>	<b>0,565***</b>	<b>0,313***</b>
Tolerance symptoms and compulsive symptoms	<b>0,618***</b>	<b>0,240***</b>	<b>0,414***</b>	<b>0,582***</b>	<b>0,595***</b>	<b>0,369***</b>
Time management problems	<b>0,466***</b>	<b>0,197***</b>	<b>0,298***</b>	<b>0,413***</b>	<b>0,443***</b>	<b>0,366***</b>

Note: \*\*\* – significance level  $p \leq 0.001$

The study of the correlation between the expression of PSMU and Internet addictive behaviour was based on the identification of groups with minimal risk of developing each form of behaviour, groups with a propensity to develop addictive features and groups with pronounced addictive features.

The CIAS total scores enabled the diagnostic stage participants (n=636) to be classified into three groups based on the severity of their addictive behaviour: a group with minimal risk of developing Internet addiction (17.3%, 115 respondents), a group with a tendency towards Internet addiction (72.4%, 458 respondents), and a group displaying signs of Internet addiction (9.5%, 60 respondents).

The study results indicate that problematic social media use is less prevalent (5.7% of the study sample) compared to Internet addictive behaviour, which was detected in 9.5%. The obtained data suggest that problematic social media use can be classified as a

form of Internet addiction, which may also include activities such as viewing entertainment content and participating in online computer games. (Table 5).

Table 5 – Relation between problematic social media use and Internet addictive behaviour among adolescents (PFUS and CIAS, n=633)

<b>Expression of problematic social media use</b>	<b>Severity of Internet addiction</b>	<b>n (%)</b>
Minimal risk (n=42)	Minimal risk (n=28)	66.7%
	Tendency to Internet addiction (n=14)	33.3%
	Internet addiction (n=0)	0
Tendency to problematic use (n=533)	Minimal risk (n=87)	15.7%
	Tendency to Internet addiction (n=425)	76.9%
	Internet addiction (n=41)	7.4%
Problematic use (n=38)	Minimal risk (n=0)	0
	Tendency to Internet addiction (n=19)	50.0%
	Internet addiction (n=19)	50.0%

The results demonstrate the general tendencies of behavioural addictions. Adolescents who are at minimal risk of problematic social media use did not exhibit signs of Internet addiction. Conversely, adolescents with problematic social media use did not exhibit minimal risks of developing Internet addiction. Therefore, school students who are at minimal risk of problematic social media use are also at minimal risk of developing Internet addiction, as reported by 66.7% of those surveyed. Among the surveyed students who exhibited problematic social media use, 76.9% also showed a propensity for Internet addiction. In 50% of cases, Internet addiction was identified in students with problematic social media use (Table 5).

In qualitative analyses of the PFUS scale scores, the following characteristics of adolescents with problematic social media use were identified:

- 86.8% spent time in SM out of boredom;
- 78.9% were characterised by difficulties in controlling the timing of social media use;

- 71.1% answered that it is characteristic of them to use SM as a means to regulate emotional state;
- 50.0% of school students reported having intrusive thoughts about using social media;
- for 42.1%, communication on social media was more comfortable than communication in real life;
- 36.8% reported a preference for social media use over other forms of activity and offline activities;
- 28.9% responded that using SM had led to problems in their lives.

In the qualitative analysis of the results of the CIAS, it was found that adolescent students were characterised by the following features of Internet addictive behaviour:

- 93.4% had control difficulties;
- 78.3% had anxiety when unable to access the Internet;
- 66.7% reported feeling uncomfortable being offline;
- 68.0% of respondents noted cases of decreasing the amount of time allotted for sleep to 4 hours a day or less due to prolonged use of the Internet;
- 66.7% could not overcome the urge to go online;
- 26.7% responded that their internet usage time has not increased in the last 6 months.
- 60.0% made unsuccessful attempts to reduce the amount of time spent online;
- 56.7% reported a reduction in leisure time;
- 50.0% reported reduced time with family due to internet use;
- 46.6% experienced negative physical effects (back pain, neck pain, etc.) from prolonged internet use;
- 85.0% of school students with Internet addiction noted that family members or people close to them have told them more than once that they spend too much time on the Internet.

The study findings suggest a significant correlation between problematic social media use and Internet addiction.

We can speak of similar trends in problematic social media use and Internet addiction:

- 1) a large proportion of the study participants had a propensity for both behavioural addictions (83.4% and 72.4% respectively);
- 2) common symptoms of social media and internet addiction include reduced ability to control addictive behaviour (compulsive symptoms), preoccupation with addictive behaviour (intrusive thoughts), and continued involvement in addictive behaviour despite clear signs of negative outcomes [Lanovaya A.M., 2022c; Lanovaya A.M., Fadeeva E.V., 2022b].

### 3.1.2. Gender characteristics of problematic social media use among adolescents

Specific gender characteristics were found when analysing the consequences of problematic social media use among adolescent boys and girls.

According to the results of Problematic Facebook\* Use Scale (PFUS), the following differences in the expression of problematic social media use among adolescent boys and girls can be noted: almost four times fewer girls were classified in the minimal risk group (9.7% for boys and 2.5% for girls), and at the same time twice as many girls were classified in the problematic social media use group (4.2% for boys and 8.3% for girls). Girls with a tendency towards problematic social media use also had significantly higher scores than boys. (Table 6).

Table 6: Expression of problematic social media use among adolescent boys and girls  
(n=633)

Expression of problematic social media use	Adolescent boys n=358		Girls n=275		P
	n (%)	M±SD	n (%)	M±SD	
Minimal risk	35 (9.8%)	16.9±1.6	7 (2.5%)	17.7±1.1	0.251
Tendency to problematic use***	308 (86.0%)	39.2±12.1	245 (89.1%)	44.0±11.3	<b>0.000</b>
Problematic use	15 (4.2%)	71.7±5.4	23 (8.5%)	71.5±5.7	0.857

\* Owned by Meta Platforms Inc., the activity of the social network is banned in the Russian Federation on the grounds of extremist activity

Note: M – mean value, SD – standard deviation, p – significance of differences in scores, \*\*\* – significance level  $p \leq 0.001$

Based on the PFUS scores, the following differences in problematic social media use by gender of study participants were highlighted. Statistically higher rates of social media use to avoid loneliness or stabilise emotional state were found among girls ( $p < 0.001$ ). Girls were more likely to be preoccupied with intrusive thoughts about social media ( $p < 0.001$ ), had more difficulty controlling their time on social media, and had more difficulty resisting the urge to go on social media ( $p < 0.001$ ). Girls' final scale scores were also significantly higher ( $p < 0.001$ ) than boys' (Table 7).

Table 7 – Comparative analysis of the expression of signs of problematic social media use among adolescent boys and girls (PFUS,  $n=633$ )

PFUS subscales	Adolescent boys n=358	Girls n=275	P
	M±SD	M±SD	
Preference for online social interactions	8.4±3.9	9.0±3.9	0.088
Mood regulation***	9.7±4.8	12.5±4.9	<b>0.000</b>
Cognitive preoccupation***	7.0±3.9	9.1±4.6	<b>0.000</b>
Compulsive use***	7.6±4.1	9.1±4.4	<b>0.000</b>
Negative outcomes	5.8±3.6	5.9±3.2	0.081
Total score***	38.5±14.8	45.6±13.9	<b>0.000</b>

Note: M – mean value, SD – standard deviation, p – significance, \*\*\* – significance level  $p \leq 0.001$

Gender differences were also found when analysing the results of SMD-Scale. It was found that girls were significantly more likely to report being unable to think about anything else because they were thinking about going on social media ( $p \leq 0.05$ ). Girls were more likely to be dissatisfied with themselves because they felt the need to spend more time on social media ( $p \leq 0.01$ ), and they were also more likely to rate their condition as worse during the period when they were unable to use social media ( $p \leq 0.05$ ). Adolescent boys were significantly less likely to deceive their parents or friends by

underestimating their actual social networking time ( $p \leq 0.05$ ). Unsuccessful attempts to reduce the amount of time spent on social media and family conflict due to its use were less typical of adolescent boys than adolescent girls ( $p \leq 0.001$ ) (Table 8).

Table 8 – Comparative analysis of the expression of signs of problematic social media use among adolescent boys and girls (SMD-Scale,  $n=498$ )

SMD-Scale	Positive responses among adolescent boys $n=292$	Positive responses among adolescent girls $n=206$	P
Preoccupation*	18 (6.2%)	23 (11.2%)	<b>0.046</b>
Increased tolerance**	16 (5.5%)	26 (12.6%)	<b>0.005</b>
Negative withdrawal symptoms*	15 (5.1%)	21 (10.2%)	<b>0.032</b>
Persistence***	38 (13.0%)	60 (29.1%)	<b>0.000</b>
Escape	38 (13.0%)	32 (15.5%)	0.425
Problems	26 (8.9%)	25 (12.1%)	0.241
Deception*	7 (2.4%)	13 (6.3%)	<b>0.028</b>
Displacement***	79 (27.1%)	117 (56.8%)	<b>0.000</b>
Conflict***	19 (6.5%)	38 (18.4%)	<b>0.000</b>
Social media use disorder	Adolescent boys $M \pm SD$	Adolescent girls $M \pm SD$	P
Total score***	0.9 $\pm$ 1.3	1.7 $\pm$ 1.7	<b>0.000</b>

Note: p – significance level; \* – significance level  $p \leq 0.05$ ; \*\* – significance level  $p \leq 0.01$ ; \*\*\* – significance level  $p \leq 0.001$ ; M – mean value, SD – standard deviation

The obtained reliable gender differences on the SMD-scale total score are consistent with the results of the PFUS: the total score for girls is statistically significantly higher ( $p \leq 0.001$ ) than for boys.

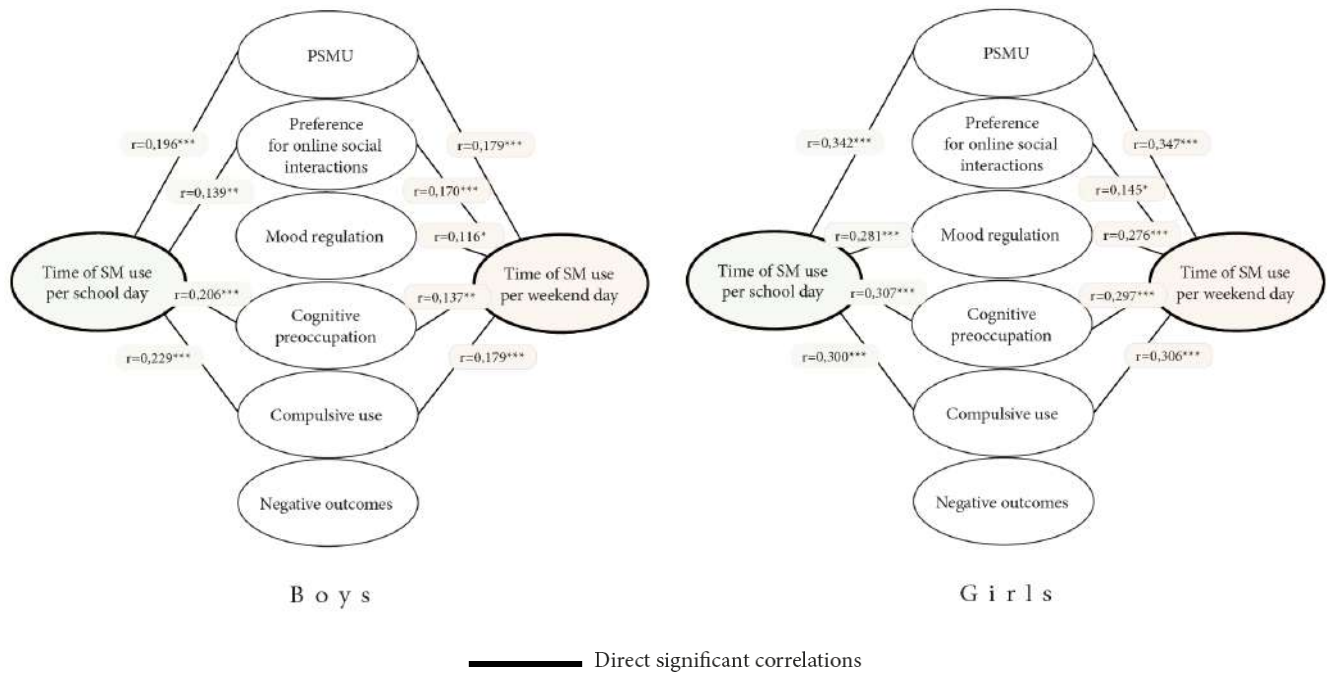
Significant differences were also found in the amount of time spent using social media on school days and weekends. Girls were statistically more likely to use social

media for 6 hours or more on both school days and weekends ( $p < 0.001$ ). Among the study participants who used social media for 6 hours or more, there were twice as many girls as boys (8.4% of boys and 21.1% of girls used social media on school days; 15.9% of boys and 33.5% of girls on weekends) (Table 9).

Table 9 – Comparative analysis of long-term use of SM among adolescent boys and girls during school days and weekends  
(Assessment of Social Media Usage Duration Scale,  $n=237$ )

Prolonged use of social media		Adolescent boys n (%)	Adolescent girls n (%)	p
6 hours or more	On a school day***	30 (8.4%)	58 (21.1%)	<b>0.000</b>
	On a weekend day***	57 (15.9%)	92 (33.5%)	<b>0.000</b>

The duration of SM use during school days and weekends by adolescent boys and girls correlated with a number of signs of problematic social media use on the PFUS (Figure 1).



Note: r – Spearman correlation coefficient; \* – significance level  $p \leq 0.05$ ; \*\* – significance level  $p \leq 0.01$ ; \*\*\* – significance level  $p \leq 0.001$

Figure 1 – Correlations between signs of problematic social media use and duration of their use during school days and weekends among adolescent boys and girls (PFUS and ASMUDS)



For girls, there were stronger correlations at a high level of significance between the time spent using social media, both during the school day and at weekends, and the PFUS scales "Mood regulation", "Cognitive preoccupation", "Compulsive use" and the Total score of the questionnaire. The reliable correlations found allow us to make the following assumptions: girls are more characterised by prolonged time spent on social media during periods of emotional decline; also, prolonged time spent is more often associated with obsessive thoughts about going on social media and with difficulties in controlling time spent on social media.

It is noteworthy that, compared to boys, for girls, no significant correlations were found between the time of SM use during school days and the preference for online social interactions, while the correlations of this scale with the time of social media use on weekends were weaker ( $r=0.145$  at  $p\leq 0.05$  for girls and  $r=0.170$  at  $p\leq 0.001$  for boys). These findings may be related to the greater propensity of males to engage in online communication, which is associated with longer use of social media during both school days and weekends.

It is worth noting that no correlations were found between time spent using social media during school days and the Mood Regulation Subscale for boys, and the strength of the relationship between this subscale and time spent using social media at weekends was weaker ( $r=0.116$  at  $p\leq 0.05$  for boys and  $r=0.276$  at  $p\leq 0.001$  for girls). It is likely that prolonged use of social media is less associated with motivation to use it to stabilise emotional state for adolescent boys than for adolescent girls.

The identified gender differences may characterise adolescent girls as a more vulnerable group to the development of patterns of social media addiction in terms of the overall expression of problematic social media use and a number of features: prolonged use on school days and weekends, regulation of emotions through social media use, cognitive preoccupation and compulsive use of social media, excessive preoccupation, tolerance growth, negative withdrawal symptoms, negative withdrawal symptoms and no use of social media [Lanovaya A.M., 2022c; Lanovaya A.M., Fadeeva E.V., 2023].

Among adolescent boys, long-term use of social media was associated with a preference for online social interactions during school days and weekends.

### **3.2. Study of motivational-semantic and psycho-emotional spheres of adolescents with different levels of expression of the problematic social media use signs**

#### **(Stage II)**

In the second stage of the study (Stage II), the empirical data were analysed based on the separation of two groups using the cluster analysis method:

- Group A, consisting of 62 (68.9%) school students, of which 25 (40.3%) were males and 37 (59.7%) were females, characterised by clear signs of problematic social media use according to the PFUS;

- Group B, which included 28 (31.1%) school students, of which 19 (67.9%) were males and 9 (32.1%) were females and characterised by minimal expression of signs of problematic social media use on the PFUS.

At this stage of the study, it was found that in group A with pronounced signs of problematic social media use, 6 (9.7%) school students used social media for 6 or more hours a day on a weekday and 16 (25.8%) on a weekend day, whereas in group B only one person (3.6%) used social media for 6 or more hours on a weekday and three (10.7%) on a weekend (Table 10). Based on similar results in paragraph 3.1, it was decided to include the factor of duration of weekend social media use in the regression model (paragraph 3.3) as a predictor variable affecting the severity of problematic social network use among adolescents.

Table 10 – Comparative analysis of the severity of problematic and prolonged use of social media during school days and weekends (PFUS and ASMUDS, n=26)

<b>Expression of problematic social media use</b>	<b>6 hours or more</b>	
	<b>on a school day n=7</b>	<b>on a weekend day n=19</b>
Group A with pronounced signs of problematic social media use	6 (9.7%)	16 (25.8%)
Group B with minimal signs of problematic social media use	1 (3.6%)	3 (10.7%)
p	0.317	0.104

Significantly higher scores in Group A on all scales of the PFUS confirmed the results of the cluster analysis, which indicated that Group A included school students whose scores showed clear signs of problematic social media use (Table 11).

Table 11 – Comparison of expression of traits of problematic social media use in Group A (n=62) and Group B (n=28)

Scale	Subscales	Group A M±SD	Group B M±SD	Criterion statistics		
				U Mann-Whitney	Z	p
PFUS	Preference for online social interactions*	7±3.7	5.2±2.2	639.5	-2.197	<b>0.028</b>
	Mood regulation***	14.4±4.1	6.8±3.6	161.5	-6.253	<b>0.000</b>
	Cognitive preoccupation***	11.3±4.0	5.4±2.8	215.5	-5.8	<b>0.000</b>
	Compulsive use***	10.6±3.1	7.2±3.0	381.0	-4.392	<b>0.000</b>
	Negative outcomes***	11.0±4.0	5.4±2.4	212.5	-5.817	<b>0.000</b>
	Total score***	54.6±10.9	30.4±7.7	2.5	-7.586	<b>0.000</b>

Note: \* – significance level  $p \leq 0.05$ , \*\*\* – significance level  $p \leq 0.001$

### 3.2.1. Psychological diagnostics of the motivational and semantic sphere peculiarities of adolescents with different expression levels of problematic social media use

Adolescence is a period of active formation of individual meaning orientations, which are prerequisites for the formation of a mature, autonomous personality. The highest system of regulation – semantic – allows the personality to make decisions based on the logic of free choice. Meaning as a component of human consciousness has intensity, which determines the direction of activity, and contextuality, which is in correlation with other concepts of a broader context [Kosobukova O.V., 2009; Leontiev D.A., 1999]. Based on the notion that the motivational and semantic sphere is directly related to the regulation of behaviour, it seems significant to study the orientation, life goals, and personal meanings of adolescents using social media.

The motivational and semantic sphere was studied using the Purpose-in-Life Test (PIL) and the Relationship Colour Test (RCT).

The results of the **Purpose-in-Life Test** allowed us to identify the following features of adolescents' personality orientation depending on the expression of problematic social media use.

Significantly higher scores were found on all scales of the Meaning-Life Orientations (PIL) test in Group B: adolescents with minimal expressions of problematic social media use showed deeper meaningfulness and direction in their lives (Table 12).

Table 12 – Comparison of the Purpose-in-Life Test (PIL) scores in Group A (n=62) and Group B (n=28)

Scale	Subscales	Group A M±SD	Group B M±SD	Criterion statistics		
				U Mann-Whitney	Z	P
<b>PIL</b>	Emotional intensity of life**	25.9±7.3	30.7±5.6	546.0	-2.973	<b>0.003</b>
	Life performance, or satisfaction with self-realisation***	22.6±6.3	28.1±3.5	422.0	-4.031	<b>0.000</b>
	Locus of control-life, or controllability of life**	28±7	32.6±4.4	529.5	-3.116	<b>0.002</b>
	Goals in life**	27.9±7.7	33.3±6.6	525.0	-3.152	<b>0.002</b>
	Locus of control-Me (I am the master of life) **	18.8±5	22.3±4.3	533.0	-3.087	<b>0.002</b>
	Total score***	90.9±19.7	107.8±15	451.5	-3.773	<b>0.000</b>

Note: \*\* – significance level  $p \leq 0.01$ , \*\*\* – significance level  $p \leq 0.001$

Based on the correlation analysis conducted between the PFUS and PIL test scales among the selected groups, the following structural diagram of problematic social media use was constructed (Figure 2).

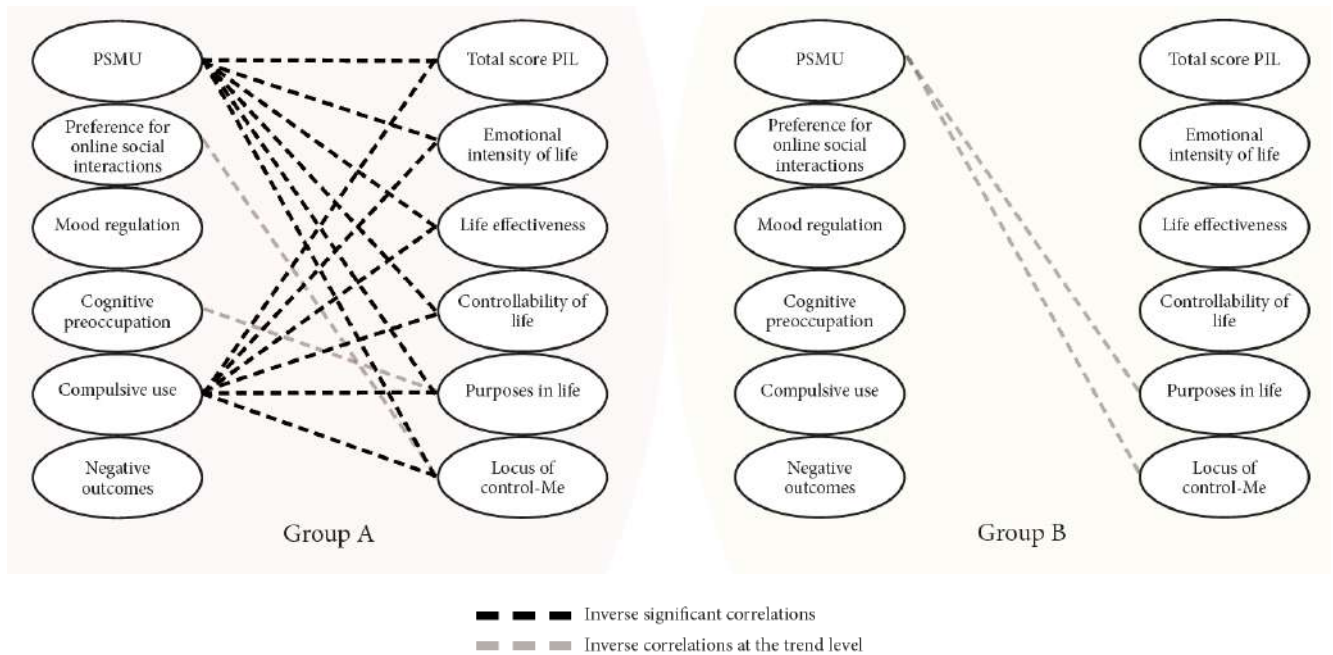


Figure 2 – Structural diagram of problematic social media use according to the PIL results

Group A. In the group with marked signs of PSMU, there were negative correlations between the total score of the PFUS (Problematic social media use) and the compulsive use of social media subscale with all scales of the Purpose in Life Test. The decrease in the meaningfulness of life for adolescents with pronounced signs of social media addiction is more strongly associated with difficulties in controlling the time spent using social media: these violations of self-control are associated in this group with a decreased sense of purpose, the feeling that life is less full of meaning and emotion, dissatisfaction with self-realisation and one's own productivity, as well as with a decreased perception of the controllability of one's own life, the so-called authorship of life, in which the person is aware of the fact that he or she is not in control of his or her own life (Appendix 9).

One of the strongest correlations of the Compulsive Use of Social Media (PFUS) was found with the Locus of Control-Self (PIL) subscale ( $r=-0.333$ ,  $p\leq 0.01$ ), suggesting that adolescents who report difficulties in controlling the timing of social media use in their behaviour may be characterised by reduced perceptions of themselves as strong individuals capable of making choices that are consistent with life goals and meanings.

At the trend level, correlations were found between "Cognitive preoccupation of Social Media" (PFUS) and "Goals in Life" (PIL) ( $r=-0.242$ ,  $p=0.058$ ), and between "Preference for online social interactions" (PFUS) and the Locus of Control – Self subscale (PIL) ( $r=-0.233$ ,  $p=0.068$ ). These results can be related to the assumption that in adolescents with problematic social media use, thoughts about the need to check social media are associated with less development and goals, planning for the future, and communication in virtual reality is associated with uncertainty in the ability to control events in their own lives [Lanovaya A.M., Fadeeva E.V., 2022a].

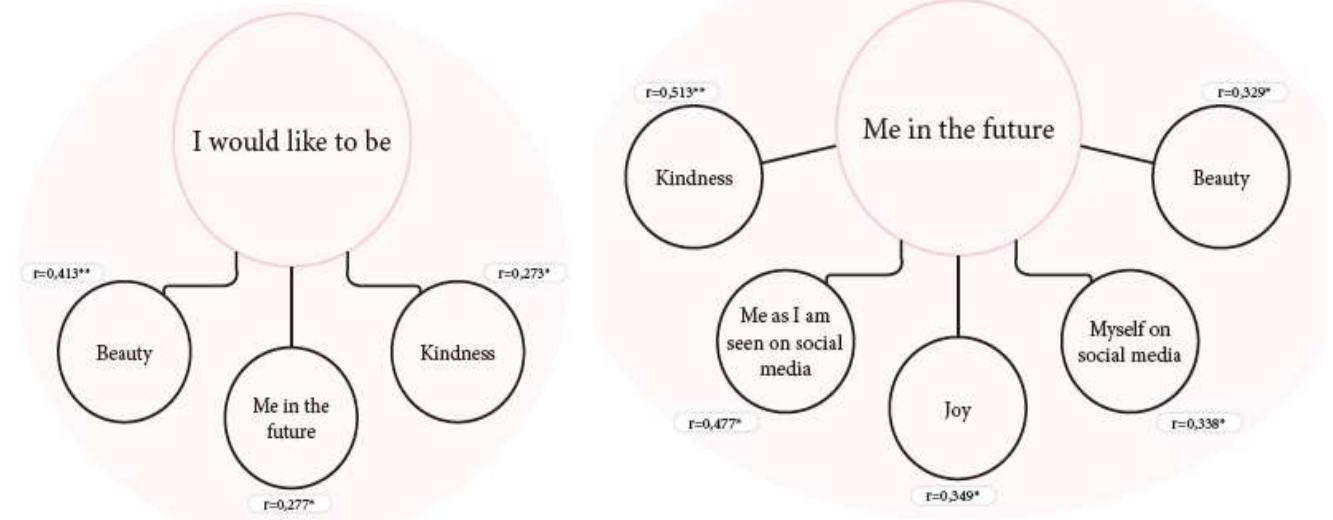
Group B. In the group with minimal expression of signs of problematic use of social media, only two negative correlations were observed at the trend level, which did not reach statistical significance: the total score on the PFUS with the "Goals in Life" and "Locus of Control – Self" (PIL) subscales. The results obtained may indicate that, even among adolescents with minimally expressed signs of addiction to social media, the existing insignificant manifestations of addictive behaviour may be associated with less focus on future prospects, achievements and feelings of helplessness, deprivation of freedom of choice (Appendix 10).

According to the results of the **Relationship Colour Test**, for each of the selected groups with different expressions of PSMU (Group A and Group B), correlation lines reflecting semantic correlations between the concepts belonging to different categories (self-identification: "I am myself", "I am what I would like to be", etc.; time "Past", "Future", etc.; emotional and ethical categories: "Kindness", "Honesty", "Happiness", "Hate", etc.; categories related to the use of social media: "I am on social media ", "Post photos on social media ", etc.).

Group A, which included adolescents with pronounced signs of problematic social media use, showed more correlations between the concepts presented, although weaker than Group B, which included adolescents with minimal signs of problematic use of social media. These differences may be related to the peculiarities of the semantic sphere of adolescents from different groups or to the limitations of the study (fewer adolescents in Group B).



in the virtual world. The concept of "I would like to be" was also correlated with the concepts of "Beauty", "Me in the future" and "Kindness" (direct correlations): probably, for adolescents in this group, the ideal image of the self is most strongly associated with external characteristics of attractiveness and personal ideas about morality, which correlate with the image of the self in



the future (Figure 4).

———— Direct significant correlations

Figure 4 – Correlation pleiades reflecting the correlations between the concepts "I would like to be" and "Me in the future" among Group A adolescents with pronounced signs of problematic social media use according to the RCT results

Group B. The concept of "I am myself" was reliably related to the concepts of "Me as I am seen on social media", "My future family", "Me in the future" (direct correlation), "Evil" (inverse correlation), and at the level of tendency "Strength" (direct correlation,  $p=0.079$ ), "Loneliness" (inverse correlation,  $p=0.065$ ). These correlations may indicate that the self-concepts of the adolescents in group B are future-oriented, that their self-image in real life is comparable to their self-image in the virtual world (on social media), and that they oppose the normative-evaluative category of evil and social isolation.

The concept "Me as others see me" correlated reliably only with the concept "Me in the future" (direct correlation) and, at the level of tendencies, with "Strength" (direct correlation,  $p=0.082$ ) and "Loneliness" (inverse correlation,  $p=0.060$ ). These correlations suggest that group B adolescents' perceptions of their future may not be as different from



those of others as in group A. Also, adolescents in this group may tend to see themselves from the outside as strong-willed and persistent people, capable of warm and close relationships (Figure 5).

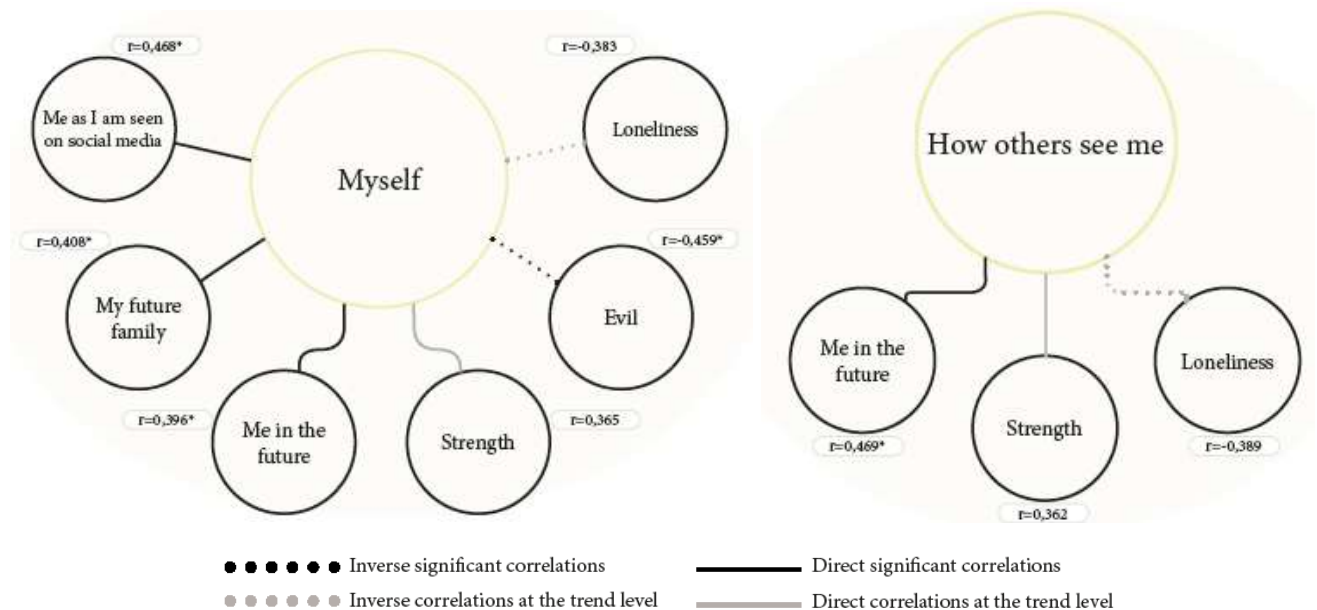


Figure 5 – Correlation pleiades reflecting the correlations between the concepts "I am myself" and "I as others see me" among Group B adolescents with minimal expression of signs of problematic social media use according to the RCT results

Correlations reflecting the desired self-image ("I would like to be" and "Calmness") (direct correlation), at the level of tendencies "Hate" ( $p=0.064$ ), "Risk" ( $p=0.84$ ) (inverse correlations), suggest that adolescents of this group now may especially lack a sense of mental balance, which can be disturbed by committing risky actions, a sense of hostility. Correlations between the concept of "Me in the future" and such concepts as "Dream", "Life", "Me as I am seen on social media", "Happiness", "Beauty", (direct correlations) and at the level of the tendency "Loneliness" (inverse correlation,  $p=0.065$ ), may reflect a positive view, perhaps a fantasy of Group B adolescents about their future, in which they are likely to have influence and a sufficient number of interpersonal contacts (Figure 6).

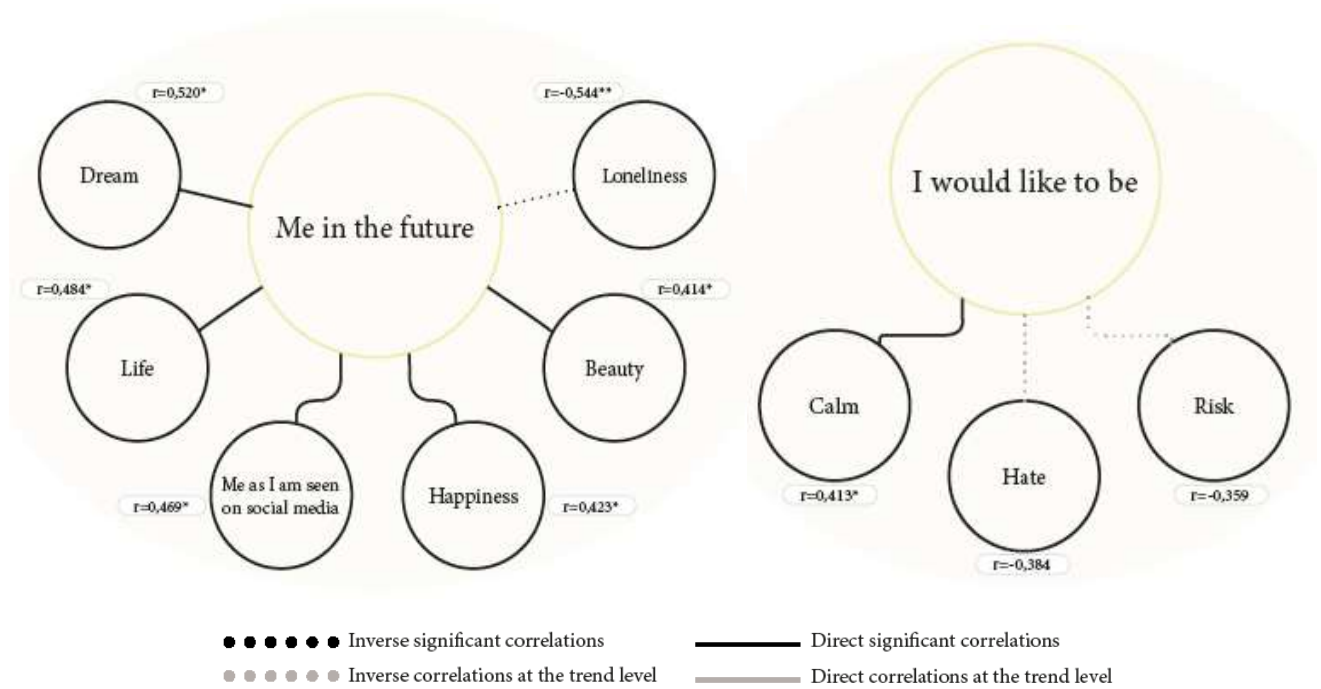


Figure 6 – Correlation pleiades reflecting the associations between the concepts "I would like to be" and "Me in the future" among Group B adolescents with minimal expression of signs of problematic social media use according to the RCT results

*Exploring the correlations related to social media use*

The study of correlations between concepts related to the use of social media and concepts of other categories allowed us to identify a number of features for the highlighted groups.

Group A. The identification concept "Myself on social media " was correlated with the concepts "My friends", "Good", "Me as others see me on social media ", "Entertainment", "Me in the future", "Mind", "Hope", "Pleasure" and "Work" (direct correlations). "Social networking" was associated with "Me in the future", "My future family", "Dream" and "Enjoyment" (direct correlations) (Figure 7).

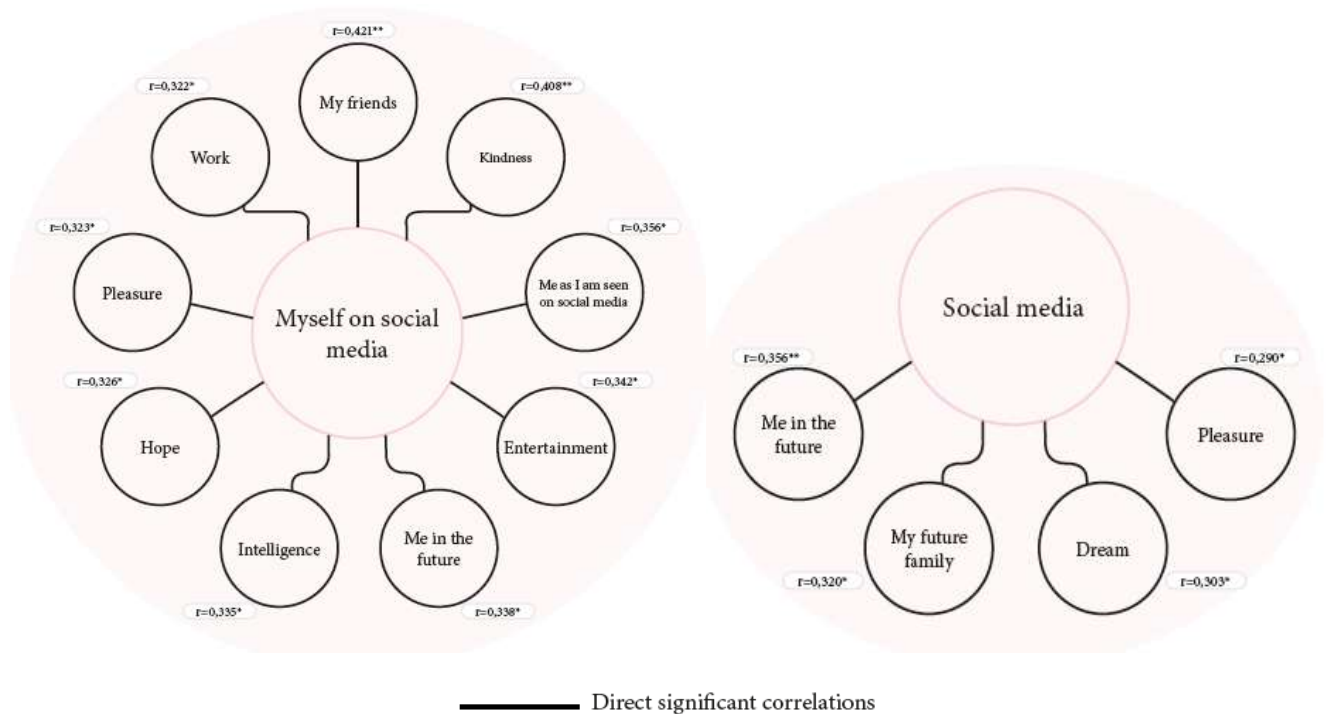


Figure 7 – Correlation pleiades reflecting the correlations between the concepts of "Myself on social media " and "Social media " among Group A adolescents with pronounced signs of problematic use of social media according to the RCT results

"Posting pictures on social media" correlated with concepts such as "Friendship," "Success," "Wealth," "Intelligence," and "Money" (direct correlations). It is noteworthy that no reliable correlations were found between the concept of "Social networking" and other concepts in this group, however, at the level of tendency we can note correlations with the concepts of "Loneliness" (inverse correlation,  $p=0.085$ ) and "Dream" (direct correlations,  $p=0.091$ ) (Figure 8).

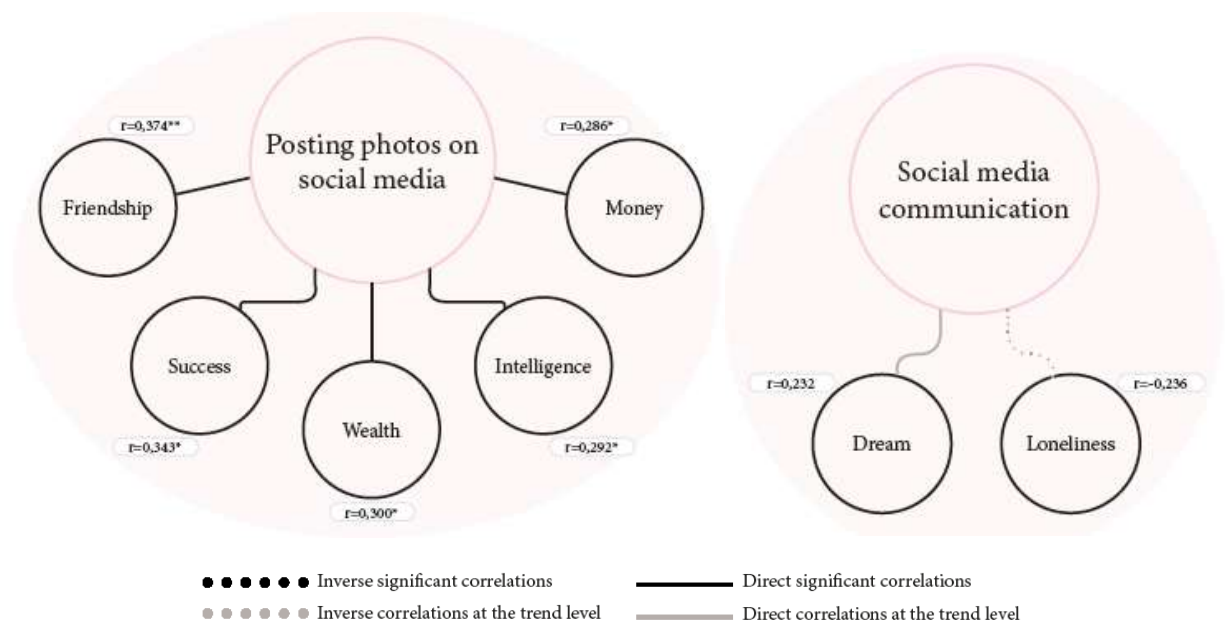


Figure 8 – Correlation pleiades reflecting the correlations between the concepts "Posting photos on social media " and "Communicating on social media " among Group A adolescents with pronounced signs of problematic use of social media, according to the data of the RCT results

Thus, in the adolescents of this group, certain connections between the use of social media and self-perceptions were revealed. The general perception of themselves on social media was positive, but did not necessarily correspond to the perceptions of themselves in real life. Social media use was associated with fulfilment of personal needs and future plans for career and family life. Group A adolescents did not report significant differences between online and real-life socialising and saw both options as equally important for avoiding feelings of loneliness.

Group B. The identification concept "I am myself on social media " correlated with the concepts "Hate", "I am myself", "My future wife (my future husband)" (direct correlations) and "Success" (feedback), at the level of tendency the correlation with the concept "I would like to be" (feedback) was revealed. The correlations of the concept "Social media " with the concept "Hate" (direct connection), "Calmness" were revealed (inverse correlation), at the level of tendency with the concept "I would like to be" (inverse correlation,  $p=0.125$ ) (Figure 9).

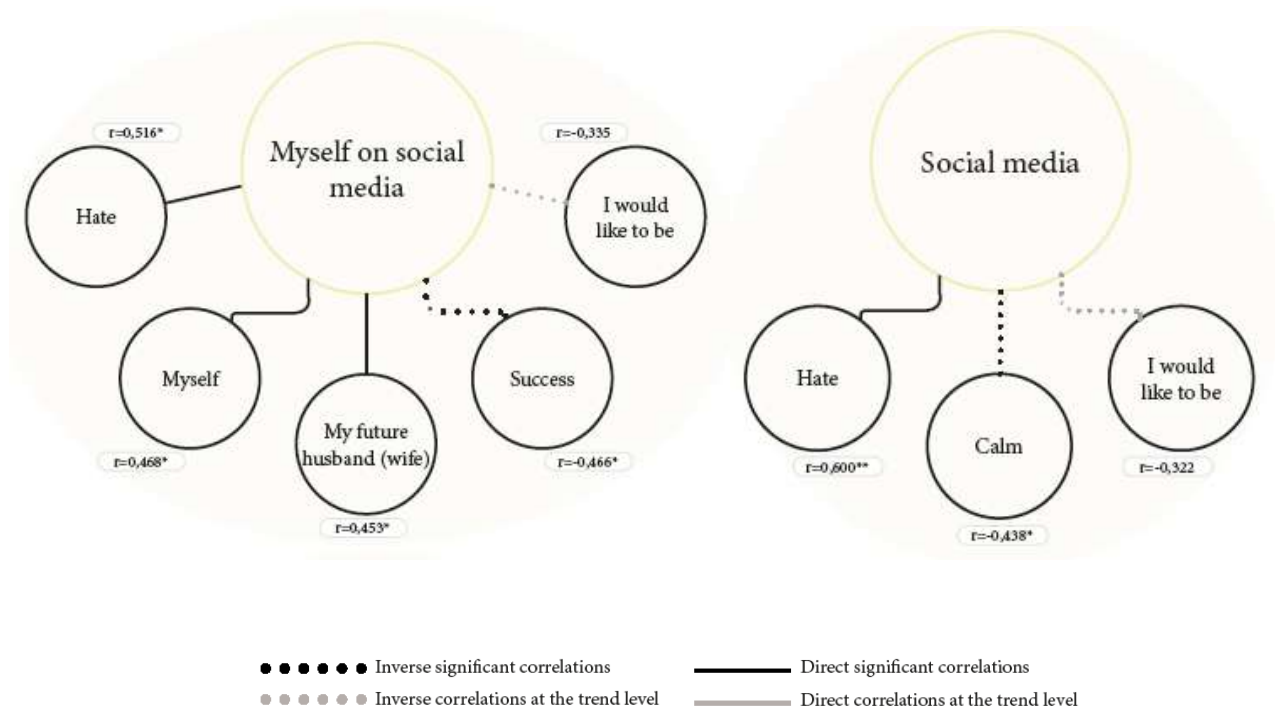


Figure 9 – Correlation pleiades reflecting the correlations between the concepts of "Myself on social media " and "Social media " among Group B adolescents with minimal expression of signs of problematic use of social media according to the RCT results

"Posting pictures on social media " was correlated with such concepts as "People I don't like", "Evil", "Grief" and at the level of trend level with the concept "Honesty" (all direct correlations). "Social networking" was correlated with the concepts of "Hate" (direct correlation) and "Intelligence" (inverse correlation) and at the trend level direct correlations were found with the concepts of "Evil" (p=0.076), "Loneliness" (p=0.078), "Indifference" (p=0.150) and "Dream" (inverse correlation, p=0.062) (Figure 10).

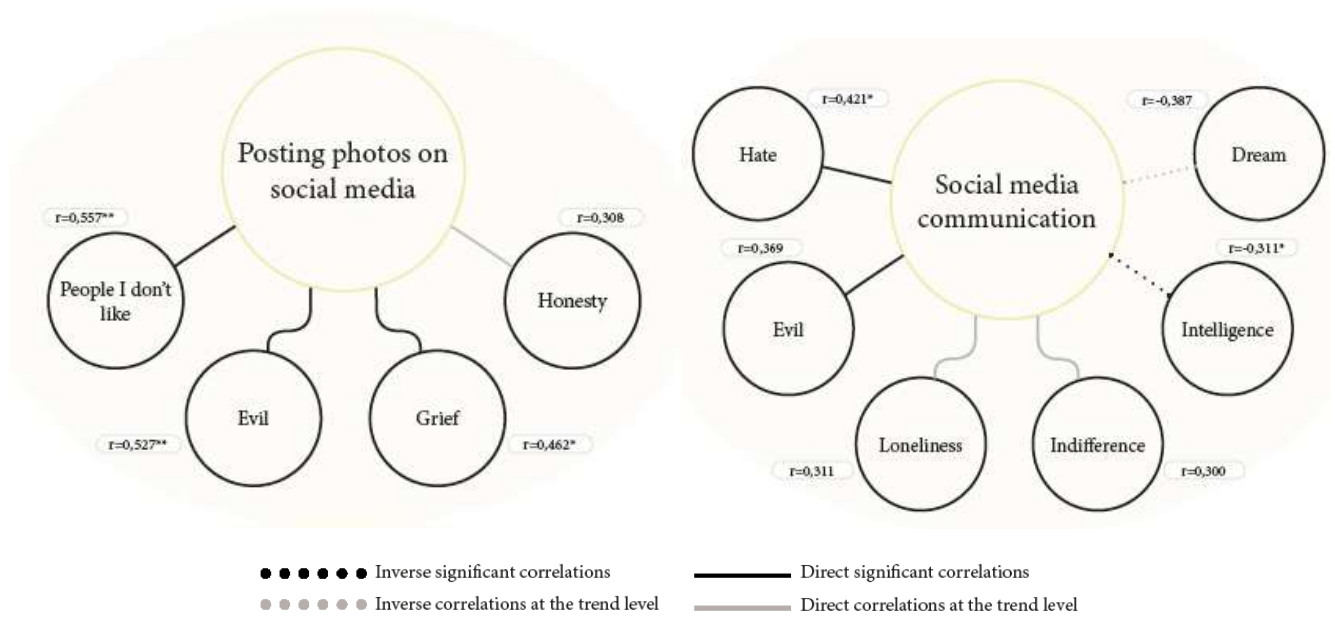


Figure 10 – Correlation pleiades reflecting the correlations between the concepts "Posting photos on social media " and "Communicating on social media " among adolescents of Group B with minimal expression of signs of problematic use of social media according to the RCT results

In Group B, with minimal expression of signs of problematic social media use, we can also identify a number of features of semantic relations concerning the use of social media that are qualitatively different from the features identified in Group A. The image of the self on social media among adolescents in this group evokes negative feelings, perhaps because it contradicts their own desires and values. Nevertheless, this group's social media self-image correlated with their real-life image, reflected approval from others (presumably having a social media account contributes to peer approval), and was associated with future romantic relationships. The observed correlations with the Social Networking concept may support the hypotheses put forward, and also suggest that for adolescents with minimal expression of signs of problematic social media use, the use of social networking sites may evoke feelings of excitement and anxiety.

It should be noted that adolescents in Group B are likely to experience a certain amount of negativity (external or internal) about themselves when posting photos on social media, which may be somewhat related to the fact that truthfulness and sincerity are particularly important to adolescents in this group when posting photos online. Social

networking for group B was also characterised by predominantly negative characteristics and was probably related to experiences of hostility and antagonism (possibly bullying – cyberbullying) on social media and feelings of loneliness. It can also be assumed that young people in this group tend to associate social networking with lower mental abilities and that the process of online communication for them is not related to their own image on social media, nor to their own desires and ideas about their imagined future.

*Study of correlations related to perception of happiness*

It is noteworthy to study the personal meaning of one of the most important existential concepts – the concept of happiness – in the selected groups (Figure 11).

Thus, common for both groups of adolescents were direct correlations of the concept of "Happiness" with the concepts of "Life", "Beauty", "Success", "Friendship", and inverse correlation with the concept of "Indifference". In general, these results can be characterised as universal values, which consist in the importance for people of friendly relationships, the opportunity to fully express their strengths, to receive approval and recognition from society, as well as the absence of indifference and indifferent attitudes. The results obtained reflect the values specific to adolescence, in which the existence of interpersonal relationships plays a paramount role, as well as the particular importance of aesthetic perfection.

It is worth noting that for group A, with pronounced signs of problematic social media use, there was a lower strength of connection between the concepts studied: such a result may be related to a lower stability of the structure of the semantic sphere.

For Group A with expressed signs of problematic social media use, the differences consisted in associative direct correlations of the concept "Happiness" with the concepts "Wealth", "Love", "Hope", "My future family", "Study" and inverse correlations with the concepts "People I do not like", "Resentment", "Fear". It can be assumed that for this group of adolescents happiness is associated with the abundance of material values. The image of happiness was represented by means of ideas about the future, probably their own family, including deep attachment in interpersonal relations. Emotional and semantic correlations of happiness with positive expectations of what is desired and the value of acquiring knowledge, possibly also related to a prosperous image of the future, were

noted. The image of happiness for Group A adolescents was contrasted with interactions with people who aroused feelings of dislike, unfair treatment, and a state of high anxiety and worry.

Group B was characterised by direct correlations of the concept of "Happiness" with the concepts of "Pleasure", "My family", "Health", "Dream", "Honesty" and inverse correlations with the concept of "Loneliness". Probably, among adolescents with minimally expressed signs of problematic social media use, the image of happiness is associated with feelings of joy and pleasant feelings, with the value of one's family, physical, spiritual and social well-being, with cherished wishes, truthfulness and sincerity. Happiness in this group is contrasted with a state in which a person lacks close emotional ties with other people.



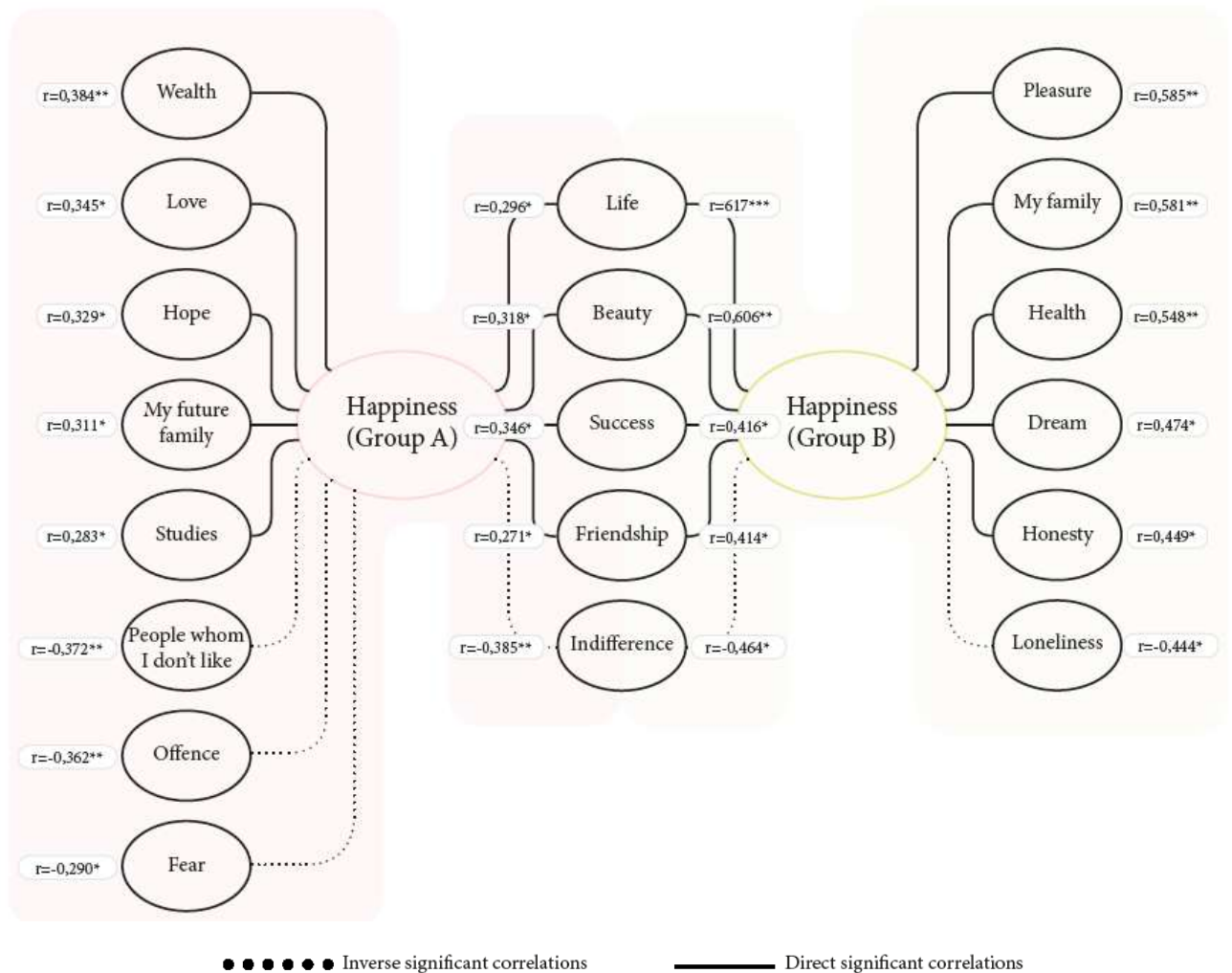


Figure 11 – Perception of happiness in Group A adolescents with expressed signs of problematic use of social media and in Group B adolescents with minimal expression of signs of problematic social media use according to the RCT results

Thus, the personal meanings of the perception of happiness in adolescents with expressed signs of problematic social media use were characterised by the value of a prosperous financial situation, orientation towards the future, the state of expectation of favourable events and excluded people causing dislike. Adolescents with minimally expressed signs of problematic social media use had an emotional and semantic connection of the image of happiness with a positive emotional background, with their family and health, and happiness was contrasted with loneliness.

The presented results may reflect the intentional side of the meaning of happiness in both groups, directing the activities of adolescents of Group A to the future, the

expectation of the occurrence of certain events, and adolescents of Group B – to live the current situation and self-realisation, which can be reflected in the development of approaches to psychological prevention and correction of problematic social media use [Lanovaya A.M., 2023].

In summary, we can say that, based on the results of the PIL and the RCT, the structural conditionality of problematic social media use is determined to a greater extent by the adolescents' focus on the future without specifying ideas for planning and achieving desired goals due to difficulties in controlling the time of using SM; positive perceptions of themselves when they are dissatisfied with their current self-realisation; reduced perceptions of the possibilities of managing their own life, associated with the compulsive social media use; the value of a favourable financial situation.

### **3.2.2. Psychological diagnostics of the psycho-emotional peculiarities of adolescents with different expression levels of problematic social media use**

Psychological diagnosis of indicators of psycho-emotional state of adolescents with different levels of problematic social media use was carried out using the **Depression, Anxiety, and Stress Scale (DASS-21)**.

Group A with pronounced signs of PSMU had significantly higher scores on all indicators of the Depression, Anxiety, and Stress Scale, which reflects the severity of emotional distress, and characterises their psycho-emotional state as less favourable (Table 13).

Table 13 – Comparison of Depression, Anxiety, and Stress Scale (DASS-21) scores in Group A (n=62) and Group B (n=28)

Scale	Subscales	Group A M±SD	Group B M±SD	Criterion statistics		
				U Mann-Whitney	Z	P
<b>DASS-21</b>	Depression***	7.8±5.4	3.4±3.9	415.0	-4.095	<b>0.000</b>
	Anxiety***	7.5±5.5	3.2±3.4	444.0	-3.849	<b>0.000</b>
	Stress**	10.1±5.2	6.6±3	530.0	-3.114	<b>0.002</b>

Note: \*\* – significance level  $p \leq 0.01$ , \*\*\* – significance level  $p \leq 0.001$

Based on the correlation analysis between the scales of the PFUS and the DASS-21 methodology, the following structural diagram of problematic social media use was constructed among the selected groups (Figure 12).

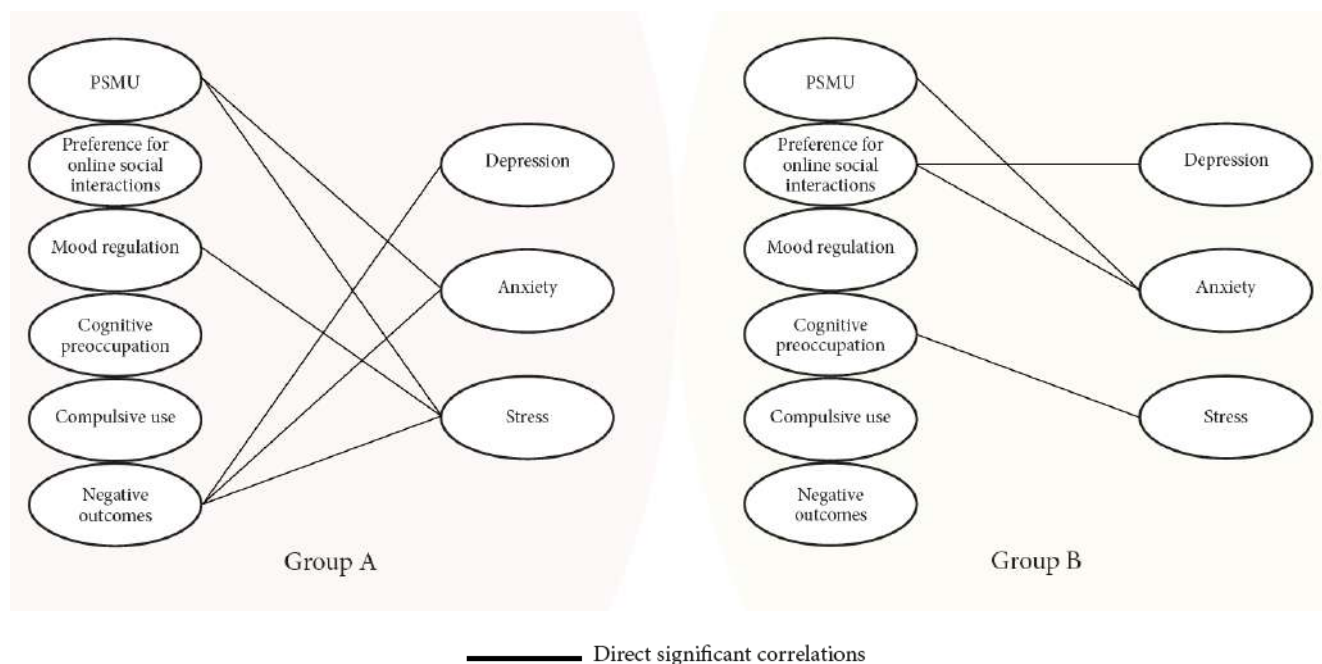


Figure 12 – Structural diagram of problematic social media use according to the DASS-21 results

Group A. In the group with pronounced signs of PSMU, indicators of depression, anxiety and stress correlated with the Negative outcomes subscale ( $r=0.289, p\leq 0.05$ ;  $r=0.338, p\leq 0.01$ ;  $r=0.384, p\leq 0.01$ ) due to excessive use of social media: It can be assumed that problematic social media use, especially adolescents' awareness of the fact that social media complicates their lives or they had to neglect various activities because of social media, is interrelated with manifestations of depressive symptomatology, anxiety, and stress reactions. There was a direct correlation between the Stress subscale and the subscale of Mood regulation via social media ( $r=0.375, p\leq 0.01$ ) (Appendix 11).

Group B. In adolescents with minimal expression of signs of problematic social media use, there was a correlation between the indicators "Depression" and "Anxiety" and the subscale "Preference for online social interactions" ( $r=0.499, p\leq 0.01$ ;  $r=0.374, p\leq 0.05$ ): users with less addictive signs in their behaviour use social media as a means to avoid real contacts in a state of low mood, feeling of helplessness, own powerlessness, fear. Also in this group, there was a correlation between the scales "Stress" and "Cognitive

preoccupation" with social media ( $r=0.379$ ,  $p\leq 0.05$ ): this correlation can be associated with the fact that in the period of heightened psycho-emotional stress, adolescents may have more intrusive thoughts about using social media or these thoughts cause a state of tension (Appendix 12).

Psychological diagnosis of emotional empathy in adolescents with different levels of problematic social media use was carried out using the **Emotional Empathic Tendency Scale (EETS)**.

Comparing the results of adolescents with pronounced signs of PSMU (Group A) and those with minimal signs (Group B), the following was revealed: significantly higher scores were observed in Group B on the subscale "Emotional sensitivity", but higher scores were found in Group A on the subscale "Empathy", characterised by pronounced signs of problematic social media use (Table 14). It can be assumed that adolescents with less addictive behaviour in relation to social media use were characterised by greater sensitivity, receptivity to external influences, while adolescents with more pronounced signs of problematic social media use had higher empathy abilities. Group A also showed higher scores on the general empathy measure at the tendency level. It is likely that adolescents with strong signs of problematic social media use rate their ability to perceive the inner world, states of other people as higher than adolescents with lower signs of problematic social media use.

Table 14 – Comparison of Emotional Empathic Tendency Scale (EETS) scores in Group A (n=62) and Group B (n=28)

Scale	Subscales	Group A M±SD	Group B M±SD	Criterion statistics		
				U Mann-Whitney	Z	P
<b>EETS</b>	Exposure to emotional contagion	4.5±1.3	4.7±0.9	781.0	-1.014	0.311
	Emotional sensitivity**	2.2±1	2.9±1.2	575.5	-2.812	<b>0.005</b>
	Understanding and respecting the feelings of others	2.9±1	3.1±0.9	829.0	-0.603	0.546

Emotional response to another's emotional experience	7.7±1.7	7.8±1.9	882.5	-0.117	0.907
Willingness to become involved in other people's problems	2.6±1	2.4±1	796.0	-0.884	0.377
Compassion*	5.7±1.4	4.9±1.4	621.5	-2.395	<b>0.017</b>
Empathy	68.7±10.2	64.3±11	685.5	-1.788	0.074

Note: \* – significance level  $p \leq 0.05$ , \*\* – significance level  $p \leq 0.01$

On the basis of the correlation analysis aimed at investigating the relationships between the PFUS and EETS scales in the selected groups, the following structural diagram of problematic social media use was constructed (Figure 13).

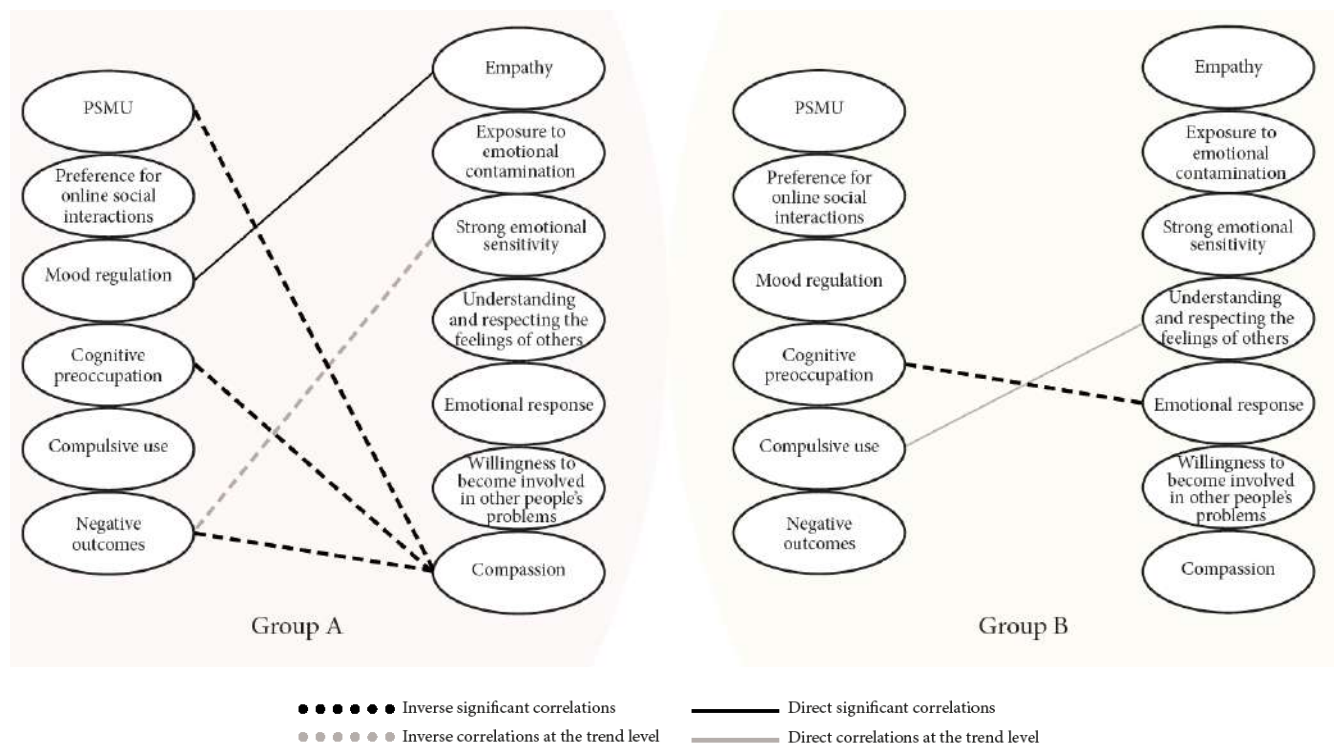


Figure 13 – Structural diagram of problematic social media use according to the EETS results

Group A. Adolescents with high levels of problematic social media use were significantly associated with the ability to show empathy on the EETS ( $r=0.347$ ;  $p \leq 0.01$ ). It can be assumed that adolescents in this group, who more often resort to stabilising their emotional state through the use of social media, may have more developed skills in verbally or emotionally expressing their state in relation to another person's experience.

Negative correlations of the "Empathy" subscale of the EETS with some scales of the PFUS were revealed: with the overall problematic social media use subscale ( $r=-0.455$ ;  $p\leq 0.01$ ), with the "Negative outcomes due to social media use" subscale ( $r=-0.375$ ;  $p\leq 0.01$ ) and with the "Cognitive preoccupation" subscale ( $r=-0.249$ ;  $p\leq 0.05$ ), which may suggest that more pronounced signs of social media addiction, particularly manifested in intrusive thoughts and negative consequences associated with social media use in the adolescent's life, are associated with reduced empathy skills focused on the well-being of others and compassion. However, it was noted earlier that Group A had higher scores on the Empathy subscale: this finding may be explained by the fact that, in general, adolescents with significant signs of problematic social media use have well-developed empathy skills, but these skills may be impaired in more persistent patterns of addictive behaviour, particularly in the presence of intrusive thoughts about social media use and the negative consequences of social media use (Appendix 13).

At the trend level in this group, we can note a negative relationship between the subscale "Emotional sensitivity" on the EETS and the indicator "Negative outcomes" on the PFUS due to the use of social media ( $r=-0.230$ ,  $p=0.072$ ). Presumably, the manifestation of particular sensitivity and susceptibility to the state of other people can be reduced in the presence of expressed signs of problematic use of social media and negative consequences due to their priority use in the lives of adolescents [Lanovaya A.M., 2022b].

Group B. In the group with minimal signs of PSMU, the scores of the "Exposure to emotional contamination" subscale on the EETS correlated with the following scales on the PFUS: with the overall problematic social media use score ( $r=-0.407$ ;  $p\leq 0.05$ ) and with the Mood regulation with Social Media subscale ( $r=-0.375$ ;  $p\leq 0.05$ ), which may indicate that adolescents with less pronounced signs of social media dependence and less use of social media to cope with emotional distress have a more developed sensitivity to another person's emotional state and ability to be empathetic.

Also in Group B, a negative relationship was found between the scales "Emotional responsiveness" on the EETS and "Cognitive preoccupation" of social media use on the PFUS ( $r=-0.446$ ;  $p\leq 0.05$ ). It can be assumed that the adolescents' ability to respond

emotionally during the perceptual process in this group decreases when there are recurrent thoughts of going and checking social media. The presence of a positive relationship at the trend level ( $r=0.323$ ;  $p=0.093$ ) between the scales "Understanding and respecting other people's feelings" on the EETS and "Compulsive use" on the PFUS may indicate in this case that for adolescents in whom minimal signs of social media addiction were found, the desire to check social media is probably linked to compliance with the social norms of virtual reality, such as accessibility and immediate response to messages from friends and acquaintances as a sign of respect and consideration for the conversation partner.

Thus, the structural conditionality of problematic social media use according to the results of the DASS-21 and the EETS is determined by: high psycho-emotional tension when using social media to regulate emotions; reduced emotional background, depression and anxiety when realising negative consequences due to excessive use of social media; developed empathy skills, which tends to decrease in the presence of obsessive thoughts about using social media and neglect of social media.

### **3.2.3. Predictors of problematic social media use among adolescents**

To investigate the influence of individual psychological and psycho-emotional characteristics and duration of social media use on the severity of problematic social media use, regression analysis was conducted (Table 15). Two regression models that met the reliability criteria are presented.

The total score for the problematic social media use (PFUS) was used as the dependent variable in both regression analysis models. In the first regression model, which was based on the results of correlational analyses of data from all Stage II participants, the scales "Life Goals" (PIL), "Emotional Sensitivity" (EETS) and "Time Spent on Social media use on Weekend" (ASMUDS) were used as independent variables. In the second regression model, the Anxiety subscale (DASS-21) was included as an independent variable.

Table 15 – Predictors of problematic social media use among adolescents

<b>Stepwise linear regression model 1</b>			
<i>Adjusted R<sup>2</sup> = 0.334, n = 90</i>			
<b>Predictors</b>	Standardised ratios	t	P
	$\beta$		
(Constanta)		6.728	0.000
Goals in life	-0.310	-3.122	0.002
Emotional sensitivity	-0.289	-3.289	0.001
Time spent on social media on a weekend day	0.248	2.462	0.016
<b>Stepwise linear regression model 2</b>			
<i>Adjusted R<sup>2</sup> = 0.216, n = 90</i>			
<b>Predictor</b>	Standardised ratios	t	P
	$\beta$		
(Constanta)		19.554	0.000
Anxiety	0.475	5.057	0.000

*Note:* R<sup>2</sup> – multiple determination coefficient,  $\beta$  – standardised regression coefficient; t – Student's criterion, p – significance level

Predictors that reliably influence the expression of characteristics of problematic social media use among adolescents have been identified.

The formation of problematic social media use in older adolescence is influenced by:

- lack of goals in life, which reduces its focus and meaning, reduced emotional sensitivity, which can negatively affect the process of interpersonal interaction, as well as longer time spent on social media at weekends in 33.4% of cases;
- anxiety manifested in subjective experiences of worry, unfavourable premonitions in 21.6% of cases.



## **Main results and conclusions**

The third chapter, "Results of the empirical study", details the findings from the study of the psychological aspects of problematic social media use among adolescents.

The first paragraph is devoted to describing the characteristics of problematic use of social media among adolescents: 1) problematic use of SM is related to Internet addictive behaviour; 2) addictive behaviour characterised by problematic use of social media was detected in 6% of adolescents, the tendency to problematic use of social media – in 83.4%; 3) signs of addiction were expressed in difficulties in controlling the time of social media use, in cognitive preoccupation with their use, in using social media despite negative consequences; 4) prolonged use of information and communication networks (6 or more hours per day) was more common among adolescents with problematic social media use; 5) problematic social media use was more common among girls, while among boys it was predominantly manifested in a preference for online communication; 6) most adolescents used information and communication networks to get rid of boredom and as a means to regulate their emotional state [Lanovaya A.M., 2022c; Lanovaya A.M., Fadeeva E.V., 2022b].

The second paragraph describes the characteristics of motivational, semantic and psycho-emotional spheres of personality of adolescents with different levels of expression of signs of problematic social media use. Structural diagrams of problematic social media use based on the data of the PIL, the DASS-21 and the EETS are presented, as well as correlation plades reflecting the peculiarities of the meaning sphere of adolescents according to the RCT results. It was found that PSMU among adolescent school students is associated with: 1) lack of purpose, dissatisfaction with self-realisation, lack of confidence in their own abilities, reduced perception of the possibilities of managing their own life and feeling that it is insufficiently filled mainly due to difficulties in controlling the time spent on social media; 2) a special structure of the semantic sphere, in which the following is noted: positive perception of the image of the " Me " both in real life and in social media, but no connections between the perceptions of the self in the real and virtual worlds were found; a future orientation based on social media self-images and including

the use of social media for self-actualisation, but without developed ideas for planning and achieving desired goals; a preference for online communication due to avoiding feelings of loneliness; the value of material well-being and future family relationships; 3) expressed signs of anxiety, psycho-emotional tension, reduced emotional background, depression, anxiety; 4) developed empathy skills, which tended to decrease with intrusive thoughts about social media use and negative consequences when using it excessively, with higher evaluation of their empathy abilities when using social media to regulate their emotional state, as well as with decreased emotional sensitivity to unfavourable consequences due to prioritised social media use [Lanovaya A.M., 2023, 2022b; Lanovaya A.M., Fadeeva E.V., 2022a].

Regression analysis allowed us to identify the following predictors of problematic social media use among adolescents: 1) a combination of a lack of goals in life, reduced emotional sensitivity and prolonged time spent on social media at weekends; 2) a strong expression of anxiety.

## CHAPTER 4. DISCUSSION OF RESEARCH RESULTS

**Prevalence of problematic social media use among adolescents.** According to the results of the research conducted among adolescent students, similar trends in the expression of problematic social media use (PFUS) and Internet addiction (CIAS) were revealed, concerning the manifestation of signs such as reduced ability to control addictive behaviour (compulsive symptoms), preoccupation with addictive behaviour (intrusive thoughts), continued involvement in addictive behaviour despite clear signs of negative consequences. Separating these concepts, when problematic social media use as an object of addiction we define Internet communication activity and (or) online social activity.

Problematic social media use and Internet addictive behaviour are two related types of behavioural addiction. It was found that problematic social media use also revealed Internet addiction, while no problematic social media use was detected in the absence of Internet addiction. These behavioural addictions can also be transformed into one of the other: increased use of the internet can be turned into prolonged use of social media.

Based on the limited number of studies reporting data on the prevalence of problematic use of social media, it seems possible to draw analogies with data from international projects and meta-analytical studies. Thus, the incidence of problematic social media use found in the present study (6.0%) is comparable to the data of international studies (7.0%) [Boer M. et al., 2020; Inchley J. et al., 2020]. In studies with a wider age range of 10-17 years, the prevalence of problematic use of social media is half as high (3%), as younger adolescents are less active in using SM compared to older adolescents [Paschke K. et al., 2021].

The prevalence of Internet addictive behaviour among adolescents in the Moscow region, found in this study (9.5%), was higher when compared with the data of international meta-analytical reviews and (7.0%) [Pan Y.-C., Chiu Y.-C., Lin Y.-H., 2020]. and with the results obtained among adolescents in Central Siberia (6.8%) [Semenova N.B. et al., 2020].but lower than in the Ural Federal District (10.4%) [Trusova

A.V., Kanashov A.E., 2021]. This variability may indicate territorial differences in the prevalence of Internet addictive behaviour in different regions and countries.

**Gender characteristics of problematic social media use among adolescents.**

The features of problematic social media use among adolescent girls revealed in this study confirm and complement the results of the study of gender differences regarding this form of behaviour, and also emphasize the special vulnerability of female users in the formation of addictive behaviour in relation to the use of social media [Abbasi I., Drouin M., 2019; Boer M. et al., 2020; Paschke K. et al., 2021; Zotova D.V., Rozanov V.A., 2019; Sirota N.A. et al., 2018; Sheinov V.P., 2021]. When studying gender differences in problematic social media use (PFUS, SMD-Scale), adolescent girls were found to have higher levels of a number of characteristics: prolonged use of SM on school days and weekends; regulation of emotions through the use of social media; cognitive preoccupation and compulsive use of social media; excessive preoccupation; increased tolerance; negative withdrawal symptoms; deception about the amount of time spent on social media; escape from reality.

Among adolescent boys, long-term use of social media was associated with a preference for online social interactions during school days and weekends. The preference for virtual communication among men was also noted in the works of Russian authors [Kazarinova E.Y., Kholmogorova A.B., 2021; Ponizovsky P.A. et al., 2021].

**Motivational and semantic sphere of adolescents with expressed signs of problematic social media use.** The importance of self-realisation is noted in the area of prevention of addictive behaviour. The presence of personal meanings contributes to the strengthening of psychological health of the personality, preventing the processes of neuroticism [Grigorieva A.A., Povarenkov Y.P., 2016]. Changes in the value sphere among adolescents with problematic social media use can be dictated by the values of wider social groups and society in an era of rapid globalisation [Lokova M.Y. et al., 2019]. Lower indicators of directionality and meaningfulness of life among adolescents with addictive behaviour patterns are consistent with the research findings on Internet addictive behaviour [Danilova N.S., Yurkevich N.A., 2022; Doronina V.F., 2017; Malygin V.L. et al., 2016; Petrikov R.I., Selezneva N.T., 2020].

Using the Purpose in Life Test (PIL), it was possible to identify significantly lower indicators of purpose in life (PIL), including general purpose in life, life goals, emotional intensity of life, satisfaction with self-realisation and life management, among adolescents with pronounced signs of problematic social media use. At the same time, lower life meaningfulness (including lack of purpose, dissatisfaction with self-realisation, difficulties in decision-making) in adolescents with PSMU was associated with difficulties in controlling the time of using social media.

The application of the Relationship Colour Test (RCT) made it possible to identify the characteristics of adolescents with expressed signs of problematic social media use about themselves in real life and on social media, as well as the subjective importance of using social media and ideas about the existential concept of happiness. It is worth noting that for adolescents with expressed signs of PSMU there was a lower strength of connection between the concepts under study: this result may be associated with a lower stability of the structure of the semantic sphere.

Adolescents with pronounced signs of problematic social media use were characterised by positive self-perceptions, but their perceptions of their life prospects and future partner were at odds with other people's perceptions of their current lives. Adolescents who spend a significant amount of time on social media are likely to form ideas about their future based on their perception of themselves and the surrounding reality in the virtual world, and their ideal self-image is most related to physical attractiveness.

In general, the perception of one's identity on social media among adolescents with pronounced signs of problematic social media use was associated with positive evaluative categories and coincided with the perception of one's image by other users, although it did not necessarily coincide with the image of "I" in real life. The use of social media by adolescents with pronounced signs of PSMU may be accompanied by a feeling of satisfaction of their own needs, associated with future plans and intentions related to family and especially to a successful career.

The obtained results may be consistent with the peculiarities of meaning-life orientations: adolescents with expressed signs of PSMU assessed their satisfaction with

their actual self-realisation quite low, they felt themselves rather passive observers of their life, however, apparently, they have formed a positive image of the future associated with the use of social media, which includes professional achievements and family well-being, despite the insufficient level of meaningfulness and direction of life in the social media. The absence of significant correlations with the concept "Communication on social media" may indicate that online communication for adolescents with expressed signs of PSMU turns out to be absolutely invisible in everyday life and does not represent as a separate type of activity of special significance, but, like real communication, is opposed to the feeling of loneliness.

When studying the image of happiness, it was noted that for adolescents with pronounced signs of PSMU, happiness is associated with material values (wealth), which is consistent with the results of other studies noting a higher level of anxiety about financial well-being and persistent orientation to their financial rights in adolescents with Internet addiction [Petrova Y.V., 2022]. The image of happiness was also associated with ideas about love and future family, which was previously emphasised by other researchers [Malygin V.L. et al., 2016; Friesen M.A., 2005]. Emotional and semantic correlations of happiness with the feeling of hope and the value of gaining knowledge were noted.

**Features of psycho-emotional state of adolescents with pronounced signs of problematic social media use.** The results of our study confirm the data on the prevalence of depressive symptoms and anxiety states among more active social media users of younger age [Boer M. et al., 2021; Brailovskaia J., Margraf J., 2020; Cataldo I. et al., 2021; Keles B., McCrae N., Grealish A., 2020; Bochaver A.A. et al., 2019; Gerasimova A.A., Kholmogorova A.B., 2020; Sheinov V.P., Devitsyn A.S., 2021b]. This study allowed us to clarify with which signs of problematic social media use (Negative outcomes and regulation of emotional state through social media ) are most correlated with a decrease in psycho-emotional well-being (DASS-21).

Among adolescents with pronounced signs of problematic social media use, indicators of depression (signs of low mood, motor and ideator retardation), stress (signs of emotional and physical tension) and anxiety (somatovegetative signs, worry) correlated with negative consequences resulting from excessive social media use. Higher

stress scores were also associated with a commitment to stabilise emotional state through social media use: the constant need to use social media during periods of psycho-emotional distress in adolescents was associated with anxiety and tension, and these indicators were mutually reinforcing.

**Features of empathy of adolescents with expressed signs of problematic social media use.** A direct correlation between empathy abilities and the expression of problematic social media use has been noted in many publications [Dalvi-Esfahani M. et al., 2021; Kuss D., Griffiths M., 2017; Luo Y., Jiang Y.2021]. In the current study, adolescents with pronounced signs of problematic social media use also had high rates of empathy (EETS). Adolescents with significant signs of problematic social media use rated their ability to perceive the inner world and states of others higher than adolescents with minimal signs of problematic social media use.

A more detailed analysis of the relationships between problematic social media use and the components of empathy allowed us to note the following: in the group of adolescents with pronounced signs of PSMU, the use of social media to regulate emotions is correlated with subjective confidence in a higher ability to show empathy; the ability to show empathy may be reduced by cognitive preoccupation with the use of social media and negative consequences due to their excessive use [Dolgova V.I., Melnik E.V., Petrova N.M., 2015].

**Predictors of the problematic social media use among adolescents.** The problem of identifying predictors of Internet addiction is actively studied by Russian researchers [Malygin V.L., Iskandirova A.I., Feklisov K., 2011; Trusova A.V. et al., 2019, 2019; Kholmogorova A.B., Gerasimova A.A., 2019]. However, the results concerning problematic social media use are reflected for the first time in Russian studies. The mathematical models presented in foreign studies, especially concerning the manifestation of stress reactions in problematic social media use, are consistent with the results obtained in this study [Fabris M.A. et al., 2020; Lin C.-Y. et al., 2020; Wartberg L., Thomasius R., Paschke K., 2021].

Based on regression models that met reliability criteria, we identified predictors of problematic social media use formation. These include: reduced perception of life goals,

reduced ability to show emotional sensitivity, prolonged use of SM over the weekend, and higher anxiety scores.

**Research perspectives.** The findings provide further perspectives for research on problematic social media use, including the expression of this behaviour among the most vulnerable populations.

It remains important to establish uniform diagnostic criteria for this form of addictive behaviour and to use the most valid and reliable psychometric tools in research.

There is a need to conduct epidemiological studies of the prevalence of problematic social media use in Russia and its regions, and to monitor the dynamics of the emergence of problematic social media use by conducting a longitudinal study that takes into account age-specific and territorial differences in high-risk groups. A deeper knowledge of the etiology and pathogenesis of problematic social media use will allow us to conduct experimental-psychological and clinical studies aimed at determining causal relationships between signs of problematic social media use and personality traits, as well as comorbidity with other mental disorders.

An important preventive goal for future research is to comprehensively assess life experiences, teach strategies for coping with anxiety and stress, and develop existential mechanisms and stable personality constructs that allow the use of social media without compromising mental health.

The results presented in the study allowed us to develop practical recommendations describing the targets of psychological prevention of problematic social media use at the universal level and at the selective and indicative levels. Preventive interventions described in available publications are consistent with our findings and aim to foster positive coping strategies to shape the formation of problematic Internet and problematic social media use, search and involvement in alternative activities, both for adolescents themselves and for their family and immediate environment, as well as psychoeducational activities [Marino C. et al., 2020; Paschke K. et al., 2021; Antonenko A.A., 2014; Malygin V.L., Iskandirova A.I., Feklisov K., 2011; Trusova A.V. et al., 2020b, 2019; Kholmogorova A.B., Gerasimova A.A., 2019; Wartberg L., Thomasius R., Paschke K., 2021]. Thus, there appears to be a broad perspective for the design, validation and



implementation of evidence-based programmes to prevent the formation of problematic social media use.

## CONCLUSION

The relevance of the research conducted was determined by a number of methodological difficulties associated with numerous nominative definitions of the observed behavioural disorder, the lack of uniformity of diagnostic criteria and gradation of the degree of expression of signs of problematic social media use, insufficient number of valid and reliable diagnostic tools.

The study conducted a theoretical and methodological analysis of Russian and foreign sources, which made it possible to present the significance of social media for society; to outline the difficulties faced by specialists in studying problematic social media use; to highlight the main results of available research on this topic. On the basis of the theoretical analysis carried out, the aim, objectives and hypotheses of the dissertation research were formulated.

The present study, aimed at identifying the peculiarities of problematic social media use and related personal characteristics of adolescent students, made it possible to clarify and specify the existing ideas about this form of addictive behaviour among Russian adolescents.

The study of the peculiarities of problematic social media use among adolescents allowed us to describe in detail the signs of addictive behaviour in problematic social media use, to identify the occurrence of this behaviour among adolescents in the Moscow region aged 15-17, to determine the relationship between problematic social media use and Internet addictive behaviour, as well as to identify the gender characteristics of problematic social media use.

The peculiarities of the motivational and semantic spheres of personality are described, as well as the peculiarities of the psycho-emotional state of Russian adolescents with different expressions of signs of problematic social media use are specified.

On the basis of the compiled structural diagrams, the structural conditionality of problematic social media use was presented for the first time, based on the study of individual interrelations of personality traits (motivational, semantic, and psycho-emotional spheres) and signs of PSMU among adolescents.

Thus, adolescents with pronounced signs of problematic social media use had: reduced purposefulness and meaningfulness of life; dissatisfaction with self-realisation in the present; lack of confidence in their own strengths and self-image as a person unable to make choices; insufficient development of plans and goals for the future; perceptions of a prosperous future based on the perception of oneself and the surrounding reality in the virtual world; lack of correlation between the images of "Me" in real life and in social media; state of anxiety and psycho-emotional tension, manifestations of depressive symptoms; decreased emotional sensitivity, decreased ability to sympathise due to obsessive thoughts about the use of social media.

Adolescents with minimal signs of problematic social media use reported: obsessive thoughts about using social media to provide online support to a companion; constant availability on social media to conform to virtual reality norms; reduced focus on future achievements and prospects; feelings of helplessness and passivity; potential risks of bullying and rejection; use of social media for communication in times of high anxiety and worry, and during periods of psycho-emotional stress to stabilise the state.

At the end of the study, regression analyses were conducted to identify predictors of problematic social media use among adolescents.

The used set of methods of psychological diagnostics of problematic social media use among adolescents showed sufficient applicability and can be recommended for use in the work of medical psychologists when studying this form of addictive behaviour.

The results of the study of psychological aspects of problematic social media use among adolescents can be used in the development of programmes that include preventive measures at the universal, selective and indicative levels, taking into account the identified vulnerabilities and psychological resources of adolescent students. This area of work is relevant and requires further development in order to prevent the formation of addictive behaviour in relation to the use of social media among adolescents.

The results of the dissertation research allow us to confirm the hypotheses put forward and to formulate the main research findings.

## FINDINGS

1. The conducted theoretical and methodological analysis allowed us to define the concept of problematic use of social media as a behaviour characterised by a tetrad of features: pronounced and stable signs of addiction, in which the object of addiction is Internet communication activity and (or) online social activity; prolonged use of social media (more than 6 hours a day); preference for online communication over live interaction and use of social media to change the mood.

2. The characteristics of problematic social media use in adolescence include: the relationship between problematic social media use and internet addictive behaviour; the high number of the risk group for the formation of signs of problematic social media use; the expression of signs of addiction, such as difficulties in control and self-regulation, cognitive preoccupation and negative consequences of excessive use.

3. The following gender characteristics of problematic social media use were identified: girls were characterised by greater susceptibility to problematic social media use mainly for emotional regulation, with a component of cognitive preoccupation and compulsive use; for boys, a correlation was identified between preference for online social interactions and prolonged social media use.

4. The structural conditionality of problematic social media use is characterised by the following features of the motivational and semantic sphere: focus on the future without specifying ideas for planning and achieving desired goals due to difficulties in controlling the time spent on social media; positive ideas about oneself with dissatisfaction with current self-realisation; reduced ideas about the possibilities of managing one's own life, associated with compulsive use of social media; and the use of social media.

5. The structural conditionality of problematic social media use is characterised by the following features psycho-emotional state of adolescents: high psycho-emotional tension when using social media to regulate emotions, as well as reduced emotional background, depression and anxiety when realising negative consequences due to excessive use of social media.

6. The structural conditionality of problematic social media use is manifested in the following characteristics of adolescents' empathy: developed empathy skills, which tend to decrease in the presence of obsessive thoughts about social media use and negative consequences in their excessive use; overestimation of their abilities to empathise when using social media to regulate emotional state; as well as decreased emotional sensitivity to adverse consequences due to prioritisation of social media use over other activities.

7. The predictors of problematic social media use among adolescents are: reduced goal-setting skills, decreased emotional sensitivity, prolonged use of social media on weekends, and high levels of anxiety.

## PRACTICAL RECOMMENDATIONS

The obtained results of the study of motivational and semantic aspects and psycho-emotional features of the personality of adolescents with different expressions of signs of problematic use of social media can be used in the development of preventive programmes aimed at preventing the formation of addictive behaviour at the universal, selective and indicative levels.

### 1. Universal prevention

Universal prevention aims to reduce the influence of risk factors for the development of problematic PSMU and increase the influence of health-promoting factors in large undifferentiated population groups or in society as a whole.

In developing universal prevention programmes, an information approach and training for adolescents, regardless of the severity of problematic social media use, can be implemented, including modules on: digital safety; healthy lifestyles; adequate sleep and physical activity; using of social media for no more than 6 hours a day; and maintaining a balance between real and virtual life communication.

### 2. Selective prevention

Selective prevention is aimed at reducing the influence of risk factors for the formation of PSMU among adolescents and increasing the influence of health-promoting factors in organised social groups.

Based on the results of the analysis, two groups of selective prevention can be distinguished: by age and by gender.

Age-specific areas of selective prevention include the development and implementation of training: training in self-regulation skills (behavioural and emotional); formation of self-image congruence in real life and in social media; developing skills in setting life goals and objectives for the short and long term; increasing sensitivity to external influences; and training in mindfulness and reflection.

Gender-specific areas: for girls – development of skills of emotional regulation skills and control of time spent on social media; for boys – equal support for live and online communication, development of communication skills.

### 3. Indicative prevention

Indicative prevention aims to prevent the emergence of PSMU among adolescents at high risk of developing mental and behavioural disorders.

For adolescents with pronounced signs of problematic social media use, it is recommended to implement individual psychological approaches aimed at identifying and correcting psychological (personal and psycho-emotional disorders) and physical (neck and back pain, carpal tunnel syndrome) forms of adolescent disadvantage.

Thematic discussions and written assignments included in the structure of trainings have an important preventive value, increase the skills of reflection and goal setting due to the participation of adolescents in discussions, the opportunity to share their point of view and listen to the opinions of classmates [Lanovaya A.M., Fadeeva E.V., Nelidov A.L., 2022].

Separately, we would like to note the importance of open emotional listening, both on the part of facilitators and programmes participants, which positively affects the dynamics of group processes and allows many school students not only to express their opinions more confidently in a real environment, but also to listen to the point of view of other training participants in accordance with accepted social norms and rules of behaviour in society and in a particular group [UNODC].

## Thesaurus

**Addictive behaviour** (synonyms: addiction, dependency) – a pattern of behaviour driven by a chemical or non-chemical dependence syndrome.

**Doomscrolling** – a media habit characterised by users constantly drawing attention to negative information in their social media news feeds, e.g. crises, natural disasters, tragedies [Maier C. et al., 2019; Sharma B., Lee S.S., Johnson B.K., 2022; Tarafdar M. et al., 2020].

**Internet addictive behaviour** – excessive, insufficiently controlled behaviour related to the use of the Internet, causing negative consequences and leading to a decrease in the quality of social and personal functioning, as well as mental and physical health disorders [Kibitov A.O., Trusova A.V., Egorov A.Yu., 2019].

**Social media (SM) or social networks** – 1) (from the English "social networking sites") – virtual communities where users can create individual public profiles, communicate with real friends and get to know others based on common interests" [Griffiths M.D., Kuss D.J., Demetrovics Z., 2014];

2) Internet platforms that allow registered users to post information about themselves in the form of text, photos or videos, as well as to interact with each other and establish social ties [Glossary of Terms].

**Messenger** (from English "message") – an Internet service for real-time messaging [Shagalova E.N., 2011].

**Online communication** (synonymous terms: virtual communication, Internet communication, Internet communication) – a type of communication that is mediated by digital technologies [Asimov E.G., Shchukin A.N., 2009; Butorina E.P., 2016].

**Deviant online behaviour** – forms of online activity that contradict the norms of social behaviour, such as cyber-bullying (online bullying), cyber-harassment (sexual harassment on the Internet) [Deviant online behaviour of adolescents and young adults in social media, 2022].



**Problematic social media use (PSMU)** is a behaviour characterised by a tetrad of attributes:

- 1) pronounced and persistent signs of addiction (difficulties in control, cognitive preoccupation, use of SM despite negative consequences), where the object of addiction is Internet communication activity and (or) online social activity;
- 2) prolonged use of social media (more than 6 hours per day);
- 3) preference of online communication to live interaction;
- 4) using of social media for mood changes.

**Fear of Missing Out Syndrome (FoMo)** – the fear of missing out on any social media postings or notifications that may play an objectively or illusorily important role in the user's social experience [Sheldon P., Antony M.G., Sykes B., 2021; Tandon A. et al., 2021].

**Technostress** – a feeling of anxiety, uncertainty, tension in the process of direct use of computer technologies, which subsequently leads to emotional rejection and prevents further mastery and use of digital devices and computer technologies [Maier C. et al., 2019; Sharma B., Lee S.S., Johnson B.K., 2022; Tarafdar M. et al., 2020; Baburin A.V., Fomina N.A., 2021].

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## Appendix

### Appendix 1

#### Problematic Facebook\* Use Scale (PFUS)

*Authors: Marino C., Vieno A., Altoè G., Spada M.M., 2017.*

*Modification: Sirota N.A., Moskovchenko D.V., Yaltonsky V.M., Yaltonskaya A.V., 2018.*

*The aim of the Scale is to identify the features of problematic social media use.*

#### Scales and scoring

Scale	Question numbers
Preference for online social interactions	1-3
Mood regulation	4-6
Cognitive preoccupation	7-9
Compulsive use	10-12
Negative outcomes	13-15

#### Results interpretation of the total PFUS scale score:

15-19 points	minimal risk of developing problematic social media use
20-64 points	tendency to problematic social media use
65 points and above	stable patterns of problematic social media use

*Instructions.* Depending on your experience with social media, please circle the answer option that reflects how much you agree with each of the statements below.

#### 1) I prefer online social interaction over face-to-face communication

Definitely disagree	Neutral				Definitely agree	
1	2	3	4	5	6	7

#### 2) Online social interaction is more comfortable for me than face-to-face interaction

Definitely disagree	Neutral				Definitely agree	
1	2	3	4	5	6	7

#### 3) I prefer communicating with people online rather than face-to-face

Definitely disagree	Neutral				Definitely agree	
1	2	3	4	5	6	7

#### 4) I have used social media to talk with others when I was feeling isolated

Definitely disagree	Neutral				Definitely agree	
1	2	3	4	5	6	7

\* Owned by Meta Platforms Inc., the activity of the social network is banned in the Russian Federation on the grounds of extremist activity

**5) I have used social media to make myself feel better when I was down**

Definitely disagree			Neutral			Definitely agree
1	2	3	4	5	6	7

**6) I have used social media to make myself feel better when I've felt upset**

Definitely disagree			Neutral			Definitely agree
1	2	3	4	5	6	7

**7) When I haven't been on social media for some time, I become preoccupied with the thought of going on social media**

Definitely disagree			Neutral			Definitely agree
1	2	3	4	5	6	7

**8) I would feel lost if I was unable to go on social media**

Definitely disagree			Neutral			Definitely agree
1	2	3	4	5	6	7

**9) I think obsessively about going on social media when I am offline**

Definitely disagree			Neutral			Definitely agree
1	2	3	4	5	6	7

**10) I have difficulty controlling the amount of time I spend on social media**

Definitely disagree			Neutral			Definitely agree
1	2	3	4	5	6	7

**11) I find it difficult to control my social media use**

Definitely disagree			Neutral			Definitely agree
1	2	3	4	5	6	7

**12) When offline, I have a hard time trying to resist the urge to go on social media**

Definitely disagree			Neutral			Definitely agree
1	2	3	4	5	6	7

**13) My social media use has made it difficult for me to manage my life**

Definitely disagree			Neutral			Definitely agree
1	2	3	4	5	6	7

**14) I have missed social engagements or activities because of my social media use**

Definitely disagree			Neutral				Definitely agree
1	2	3	4	5	6	7	

**15) My social media use has created problems for me in my life**

Definitely disagree			Neutral				Definitely agree
1	2	3	4	5	6	7	

### Social Media Disorder Scale (SMD-Scale)

*Author: Regina J.J.M. van den Eijnden et al, 2016*

*Translation: Health Behaviour in School-Aged Children (HBSC) Russian version of the Health Behaviour in School-Aged Children project, 2018.*

*Purpose is to assess the signs of addictive behavior in social media use.*

#### Scales and scoring

Scale	Question number
Preoccupation	1
Tolerance	2
Withdrawal	3
Persistence	4
Escape	5
Problems	6
Deception	7
Displacement	8
Conflict	9
Total score	1-9

#### Results interpretation

The answer "Yes" corresponds to 1 score	
1-5 points	minimal risk of developing problematic social media use
6 points and above	problematic social media use

**Instruction:** Below is a list of choices of statements related to the use of social networks (VKontakte, Tik-Tok, Telegram, etc.). Please read each of them carefully, and choose the answer that most accurately reflects the character of your use of social media over the past 12 months.

Please select one answer choice for each statement.

- 1. During the past year, have you regularly found that you can't think of anything else but the moment that you will be able to use social media again?**

Yes	No
1. <input type="checkbox"/>	2. <input type="checkbox"/>

- 2. During the past year, have you regularly felt dissatisfied because you wanted to spend more time on social media?**

Yes	No
1. <input type="checkbox"/>	2. <input type="checkbox"/>

- 3. During the past year, have you often felt bad when you could not use social media?**

Yes	No
1. <input type="checkbox"/>	2. <input type="checkbox"/>

- 4. During the past year, have you tried to spend less time on social media, but failed?**

Yes	No
1. <input type="checkbox"/>	2. <input type="checkbox"/>

5. During the past year, have you regularly neglected other activities (e.g. hobbies, sport) because you wanted to use social media?

Yes	No
1. <input type="checkbox"/>	2. <input type="checkbox"/>

6. During the past year, have you regularly had arguments with others because of your social media use?

Yes	No
1. <input type="checkbox"/>	2. <input type="checkbox"/>

7. During the past year, have you regularly lied to your parents or friends about the amount of time you spend on social media?

Yes	No
1. <input type="checkbox"/>	2. <input type="checkbox"/>

8. During the past year, have you often used social media to escape from negative feelings?

Yes	No
1. <input type="checkbox"/>	2. <input type="checkbox"/>

9. During the past year, have you had serious conflict with your parents, brother(s) or sister(s) because of your social media use?

Yes	No
1. <input type="checkbox"/>	2. <input type="checkbox"/>



## Assessment of Social Media Usage Duration Scale (ASMUDS)

*Authors: Fadeeva E.V., Lanovaya A.M.*

*Purpose is to evaluate of quantitative parameters of social media use.*

Instruction. Many people's forms of communication nowadays involve not only live interaction but also online communication. The questions below refer to your use of social networks in the last 12 months (e.g. VKontakte, TikTok, Telegram).

### 1) How often do you use social media (VKontakte, Tik-Tok, Telegram, etc.)?

Almost never	A few days a month	A few days a week	Almost every day	Every day
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

### 2) How much time do you spend on average on social media in a typical school day (VKontakte, Tik-Tok, Telegram, etc.) (Can be viewed in your phone settings)

None	15-30 minutes	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>	6. <input type="checkbox"/>	7. <input type="checkbox"/>	8. <input type="checkbox"/>

### 3) How much time do you spend on average on social media on a typical weekend day? (You can look in your phone settings)

None	15-30 minutes	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>	6. <input type="checkbox"/>	7. <input type="checkbox"/>	8. <input type="checkbox"/>

### 4) How much do you use social media on average per day for academic purposes?

None	15-30 minutes	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>	6. <input type="checkbox"/>	7. <input type="checkbox"/>	8. <input type="checkbox"/>

### 5) How much do you use social media on average per day for work business purposes (for work or part time work)?

None	15-30 minutes	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>	6. <input type="checkbox"/>	7. <input type="checkbox"/>	8. <input type="checkbox"/>

### Chen Internet Addiction Scale (CIAS)

Author: Chen S.-H., 2003.

Adaptation: Malygin V.L., Feklisov K.A., 2011. Validation: Trusova A.V., Shumskaya D.S., Kibitov A.O. 2021

Purpose is to identify the characteristics of Internet addictive behaviour.

#### Scales and scoring

Scale	Question number
Interpersonal and Health-related Problems	5, 7, 12, 13, 15, 17, 21, 24
Withdrawal	2, 4, 10, 16, 20
Tolerance and compulsive symptoms	1, 3, 6, 9, 11, 14, 19, 22
Time management problems	8, 18, 23, 25, 26

#### Results interpretation of the total CIAS scale score

26–31 points	minimal risk of developing Internet addiction
32–64 points	propensity for Internet addiction
65 points and above	stable pattern of Internet addictive behaviour

#### Have you used the internet in the last 6 months?

- YES (Please continue filling in)  
 NO (Please stop here)

*Instructions.* Below is a list of statements related to internet use that people with experience of being online might agree with.

Please read each one carefully, and choose the answer that most accurately reflects the nature of your online experience over the past 6 months.

There are 4 choices for your answer, from least, to most appropriate. Please tick only one answer for each item and do not skip any items.

#### 1. I was told more than once that I spend too much time online.

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

#### 2. I feel uneasy once I stop going online for a certain period of time.

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

#### 3. I find that I have been spending longer and longer periods of time online.

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**4. I feel restless and irritable when the Internet is disconnected or unavailable.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**5. I feel energized online.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**6. I stay online for longer periods of time than intended.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**7. Although using the Internet has negatively affected my relationships, the amount of time I spend online has not decreased**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**8. More than once, I have slept less than four hours due to being online.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**9. I have increased substantially the amount of time I spend online.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**10. I feel distressed or down when I stop using the Internet for a certain period of time.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**11. I fail to control the impulse to log on.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**12. I find myself going online instead of spending time with friends.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**13. I get backaches or other physical discomfort from spending time surfing the net.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**14. Going online is the first thought I have when I wake up each morning.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**15. Going online has negatively affected my schoolwork or job performance**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**16. I feel like I am missing something if I don't go online for a certain period of time.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**17. My interactions with family members have decreased as a result of Internet use.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**18. My recreational activities have decreased as a result of Internet use.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**19. I fail to control the impulse to go back online after logging off for other work.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**20. My life would be joyless without the Internet.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**21. Surfing the Internet has negatively affected my physical health.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**22. I have tried to spend less time online but have been unsuccessful.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**23. I make it a habit to sleep less so that more time can be spent online.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**24. I need to spend an increasing amount of time online to achieve the same satisfaction as before.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**25. I fail to have meals on time because of using the Internet.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**26. I feel tired during the day because of using the Internet late at night.**

Does not match my experience at all	Probably does not match my experience	Probably matches my experience	Definitely matches my experience
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

### Purpose-in-Life Test (PIL)

*Authors: Crumbaugh J.S., Maholick L.T., 1981.[84]*

*Adaptation: Leontiev D.A., 2000.*

*Purpose is to study of personal perceptions of the factors of meaningfulness of one's own life.*

#### Scales and scoring

Conversion of the numerical series «3 2 1 0 1 2 3»	Question number
To the ascending scale «1 2 3 4 5 6 7»	1, 3, 4, 8, 9, 11, 12, 16, 17
To the descending scale «7 6 5 4 3 2 1»	2, 5, 6, 7, 10, 13, 14, 15, 18, 19, 20
Scale	Question number
Purposes in life	3, 4, 10, 16, 17, 18
The process of life, or the interest and emotional intensity of life	1, 2, 4, 5, 7, 9
Life effectiveness, or satisfaction with self-realisation	8, 9, 10, 12, 20
Locus of control-Self (I am the master of life)	1, 15, 16, 19
Locus of control-life, or controllability of life	7, 10, 11, 14, 18, 19
Total score	1-20

*Instructions.* You are offered pairs of opposite statements. Your task is to choose one of the two statements, which, in your opinion, is more true, and mark one of the numbers 1, 2, 3, depending on how confident you are in your choice (or 0 – neither).

<b>1. I'm usually very bored</b>	3	2	1	0	1	2	3	<b>I'm usually full of energy.</b>
<b>2. Life seems always exciting and thrilling to me</b>	3	2	1	0	1	2	3	<b>Life seems perfectly calm and routine to me</b>
<b>3. I have no definite goals and intentions in life</b>	3	2	1	0	1	2	3	<b>I have very clear goals and intentions in life.</b>
<b>4. My life seems to me extremely meaningless and aimless</b>	3	2	1	0	1	2	3	<b>My life seems very meaningful and purposeful to me.</b>
<b>5. Every day seems to me always new and different from the others</b>	3	2	1	0	1	2	3	<b>Every day seems quite similar to every other day.</b>
<b>6. When I retire, I will do the interesting things I have always wanted to do</b>	3	2	1	0	1	2	3	<b>When I retire, I will try not to burden myself with any worries.</b>

<b>7. My life has turned out exactly the way I dreamed it would.</b>	3	2	1	0	1	2	3	<b>My life hasn't turned out the way I dreamed it would.</b>
<b>8. I have not been successful in fulfilling my life plans</b>	3	2	1	0	1	2	3	<b>I have accomplished many of the things I had planned for my life.</b>
<b>9. My life is empty and uninteresting</b>	3	2	1	0	1	2	3	<b>My life is filled with interesting things to do.</b>
<b>10. If I had to summarise my life today, I would say that it has been quite meaningful. 11.</b>	3	2	1	0	1	2	3	<b>If I had to summarise my life today, I would say it has been meaningless.</b>
<b>11. If I could choose, I would have organised my life very differently.</b>	3	2	1	0	1	2	3	<b>If I could choose, I would live life again the way I live it now.</b>
<b>12. When I look at the world around me, it often leaves me confused and anxious</b>	3	2	1	0	1	2	3	<b>When I look at the world around me, it doesn't make me feel anxious or confused at all.</b>
<b>13. I am a very obliging person</b>	3	2	1	0	1	2	3	<b>I'm a person who is not compulsive at all.</b>
<b>14. I believe that a person has the ability to realise his life choices at will</b>	3	2	1	0	1	2	3	<b>I believe that a person is deprived of the ability to choose because of the influence of natural abilities and circumstances.</b>
<b>15. I can definitely call myself a goal-oriented person</b>	3	2	1	0	1	2	3	<b>I cannot call myself a goal-oriented person.</b>
<b>16. I have not yet found my vocation and clear goals in life</b>	3	2	1	0	1	2	3	<b>I have found my vocation and goals in life.</b>
<b>17. My life views have not yet been defined</b>	3	2	1	0	1	2	3	<b>My life views are quite defined</b>
<b>18. I believe that I have succeeded in finding my vocation and interesting goals in life</b>	3	2	1	0	1	2	3	<b>I am hardly able to find a vocation and interesting goals in life</b>
<b>19. My life is in my hands and I am in control of it myself</b>	3	2	1	0	1	2	3	<b>My life is out of my control and driven by external events.</b>
<b>20. My daily activities bring me pleasure and satisfaction</b>	3	2	1	0	1	2	3	<b>My everyday life is full of troubles and worries.</b>

**Relationship Colour Test (RCT)**

*Authors: Bazhin E.F., Etkind A.M., 1985.*

*Variant of psychosemantic technique: E.G. Dozortseva, 2004.*

*Modification: introduction of concepts related to the use of social media: " Myself on social media", "Me as I am seen in social media", " Social media news feed ", " Social media communication", "Posting photos on social media".*

*Purpose is to represent the semantic sphere by describing the internal attitude of a person to the used structural and content characteristics.*

Analysis and results interpretation (Dozortseva E.G., 2004)

The place of the colour associated by the subject with a particular concept is analysed, in the sequence by preference (colours)		
Method of mathematical analysis	Statistical test	Interpretation
Correlation analysis	Spearman rank correlation coefficient	Correlation piades reflect semantic relations between individual concepts. It is particularly important to analyse the connections of identification concepts with other concepts
Cluster analysis	Ward's method	The groups (associations) of interrelated concepts are identified and interpreted

*Procedure for conducting the CET*

*The test procedure is a colour-association experiment*

**Stage 1.** The classic M. Lusher Colour Choice Test is conducted. The choice is made twice (interpretation by the second choice).

*Instruction 1.* Choose the colour that is most pleasing to you right now. Now, from the remaining colours, choose the one that is most pleasing to you....

*Instruction 2.* Now we are going to do the same task. We are not testing your memory, the order of the colours may change, and that's okay. Choose the colour that you feel most comfortable with at the moment...( etc.).


**Stage 2.** Colour stimuli are again laid out in a semicircle in front of the participant in such a way that they do not overlap and are directly in the field of vision without reflections and glare from lighting devices.

*Instruction 3.* Now I will call you words. You need to show the most appropriate colour to them. You don't need to name the colour, just point to it. There are many words and colours may be repeated. Try to do it as quickly as possible.



## List of concepts

<b>№</b>	<b>Concept</b>	<b>Colour</b>	<b>№</b>	<b>Concept</b>	<b>Colour</b>
1	Today's weather		38	Alcohol	
2	Joy		39	Strength	
3	Girls		40	Grandpa	
4	Grief		41	Future	
5	Past		42	Calm	
6	Happiness		43	Teenager	
7	Kindness		44	Smoking	
8	Boy		45	I would like to be	
9	Honesty		46	Indifference	
10	Studies		47	Sister	
11	Social media communication		48	Hope	
12	Present		49	My future husband (wife)	
13	My future family		50	Pain	
14	Friendship		51	Myself on social media	
15	Money		52	Me as I am seen on social media.	
16	A man		53	People	
17	Myself		54	Loneliness	
18	How others see me		55	My mother	
19	My father		56	Trust	
20	Life		57	Entertainment	
21	Pleasure		58	Child	
22	Woman		59	Risk	
23	My friends		60	Faith	
24	Posting photos on social media		61	Social media news feed	
25	Love		62	Me in the future	
26	Offence		63	Health	
27	People I don't like		64	Intelligence	
28	Dream		65	My family	
29	Weakness		66	Adult	
30	Evil		67	Brother	
31	Wealth		68	Hate	
32	Drugs		69	Work	
33	My mood now		70	Classmates	
34	Death		71	Conscience	
35	Social media		72	Fear	
36	Beauty		73	Success	
37	Grandmother				

## Depression, Anxiety, and Stress Scale (DASS-21)

*Authors: Lovibond S.H., Lovibond P.F., 1995.*

*Adaptation: Ruzhenkova V.V., Ruzhenkov V.A., Khamskaya I.S., 2020.*

*Purpose is to screen-diagnose depression, anxiety and stress.*

### Scoring

Did not apply to me at all	Applied to me to some degree, or some of the time	Applied to me to a considerable degree or a good part of time	Applied to me very much or most of the time
0 points	1 point	2 points	3 points

### Scales and results interpretation

	Depression	Anxiety	Stress
Questions	3,5,10,13,16,17,21	2,4,7,9,15,19,20	1,6,8,11,12,14,18
Normal level	0-4	0-3	0-7
Moderate level	5-6	4-5	8-9
Medium level	7-10	6-7	10-12
Severe level	11-13	8-9	13-16
Extremely severe level	14+	10+	17+

**Instructions.** Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

- 1 Did not apply to me at all
- 2 Applied to me to some degree, or some of the time
- 3 Applied to me to a considerable degree or a good part of time
- 4 Applied to me very much or most of the time

1 (S)	<b>I found it hard to wind down</b>	0	1	2	3
2 (A)	<b>I was aware of dryness of my mouth</b>	0	1	2	3
3 (D)	<b>I couldn't seem to experience any positive feeling at all</b>	0	1	2	3
4 (A)	<b>I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)</b>	0	1	2	3
5 (D)	<b>I found it difficult to work up the initiative to do things</b>	0	1	2	3
6 (S)	<b>I tended to over-react to situations</b>	0	1	2	3
7 (A)	<b>I experienced trembling (e.g. in the hands)</b>	0	1	2	3
8 (S)	<b>I felt that I was using a lot of nervous energy</b>	0	1	2	3
9 (A)	<b>I was worried about situations in which I might panic and make a fool of myself</b>	0	1	2	3

10 (D)	<b>I felt that I had nothing to look forward to</b>	0	1	2	3
11 (S)	<b>I found myself getting agitated</b>	0	1	2	3
12 (S)	<b>I found it difficult to relax</b>	0	1	2	3
13 (D)	<b>I felt down-hearted and blue</b>	0	1	2	3
14 (S)	<b>I was intolerant of anything that kept me from getting on with what I was doing</b>	0	1	2	3
15 (A)	<b>I felt I was close to panic</b>	0	1	2	3
16 (D)	<b>I was unable to become enthusiastic about anything</b>	0	1	2	3
17 (D)	<b>I felt I wasn't worth much as a person</b>	0	1	2	3
18 (S)	<b>I felt that I was rather touchy</b>	0	1	2	3
19 (A)	<b>I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)</b>	0	1	2	3
20 (A)	<b>I felt scared without any good reason</b>	0	1	2	3
21 (D)	<b>I felt that life was meaningless</b>	0	1	2	3

### Emotional Empathic Tendency Scale (EETS)

*Authors: Mehrabian A., Epstein N., 1972.*

*Adaptation: Orlov Y.M., Emelyanov Y.N., 1986.*

*Purpose is to analyse the general empathic qualities of the subject, the level of expression of the ability to respond emotionally to the experiences of another and the degree of correspondence and inconsistency of the sign of the experiences of the object and subject of empathy.*

#### Scales and scoring

Direct order	Reverse order
Disagree (never) – 1 point Rather disagree (rarely) – 2 points Rather agree (often) – 3 points Agree (always) – 4 points	Disagree (never) – 4 points Rather disagree (rarely) – 3 points Rather agree (often) – 2 points Agree (always) – 1 point
Questions	Questions
1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 18, 19, 20, 22, 23	2, 4, 15, 16, 17, 21, 24, 25
Scales	
Exposure to emotional contamination	8, 15
Emotional sensitivity	6
Understanding and respecting the feelings of others	21
Emotional responsiveness to others' emotional experiences	10, 11, 16
Willingness to become involved in other people's problems	9
Compassion	19, 25
Total score for emotional empathy	1-20

#### Results interpretation

11 points or less	Very low level
12-36 points	Low level
37-62 points	Normal level
63-81 points	High level
82-90 points	Very high level

*Instructions.* Read the statements below and rate the extent to which you agree or disagree with each one, based on how you normally behave in these situations.

#### 1. It makes me sad when I see a stranger feeling lonely among other people

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

#### 2. I don't like it when people don't know how to hold back and show their feelings openly

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**3. When someone near me gets nervous, I get nervous too**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**4. I think it's stupid to cry from happiness**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**5. I take my friends' problems to heart**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**6. Sometimes love songs make me feel a lot of feelings**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**7. I would be very worried (worried) if I had to tell a person unpleasant news to them**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**8. My mood is very much influenced by the people around me**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**9. I would like to get a profession related to communication with people**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**10. I really enjoy watching people accept gifts**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**11. When I see a person crying, I (myself) get upset too**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**12. Listening to some songs makes me feel happy (happy) at times**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**13. When I read a book (novel, novella, etc.), I experience it as if everything I'm reading about is happening in reality**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**14. When I see someone being mistreated, I always get angry**

Disagree (never))	Rather disagree (rarely)	Rather agree (often)	Agree (always)
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1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>
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**15. I can stay calm even if everyone around me is worried**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**16. I don't like it when people sigh and cry when watching a film**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**17. When I make a decision, other people's attitudes towards it usually don't matter**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**18. I lose my peace of mind when people around me are depressed about something**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**19. I get worried if I see people who get upset easily over trifles**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**20. I get very upset when I see animals suffering**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**21. It's silly to worry about what happens in a film or what you read about in a book**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**22. I get very upset when I see helpless old people**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**23. I get very anxious when I watch a film**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**24. I can remain indifferent (indifferent) to any excitement around me**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

**25. Little babies cry for no reason**

Disagree (never)	Rather disagree (rarely)	Rather agree (often)	Agree (always)
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>

Correlation coefficients between indicators of problematic use of social media (PFUS) and the scales of the Purpose-in-Life Test (PIL) in Group A with pronounced signs of problematic social media use (n=62)

<b>PIL Scales</b>	<b>PFUS Total score</b>	<b>Preference for online social interaction</b>	<b>Mood regulation</b>	<b>Cognitive preoccupation</b>	<b>Compulsive use</b>	<b>Negative outcomes</b>
Emotional intensity of life	<b>-0,315*</b>	-0,106	-0,164	-0,135	<b>-0,294*</b>	-0,063
Life effectiveness	<b>-0,305*</b>	-0,136	-0,043	-0,172	<b>-0,296*</b>	-0,177
Life Control	<b>-0,349**</b>	-0,212	-0,092	-0,193	<b>-0,277*</b>	-0,214
Purposes in life	<b>-0,320*</b>	-0,225	-0,149	<b>-0,242</b> p=0,058	<b>-0,261*</b>	-0,078
Locus of control – Self	<b>-0,356**</b>	<b>-0,233</b> p=0,068	-0,191	-0,158	<b>-0,333**</b>	-0,090
Total score	<b>-0,385**</b>	-0,166	-0,143	-0,218	<b>-0,360**</b>	-0,143

Note: \* – significance level  $p \leq 0.05$ ; \*\* – significance level  $p \leq 0.01$ ; \*\*\* – significance level  $p \leq 0.001$

Correlation coefficients between indicators of problematic use of social media (PFUS) and the scales of the Purpose-in-Life Test (PIL) in Group B with minimal expression of signs of problematic social media use (n=28)

Шкалы Теста смысло- жизненных ориентаций (СЖО)	PFUS Total score	Preference for online social interaction	Mood regulation	Cognitive preoc- cupation	Compul- sive use	Negative outcomes
Emotional intensity of life	-0,117	-0,003	-0,095	-0,098	-0,044	0,088
Life effectiveness	-0,365	-0,233	-0,260	-0,106	-0,189	-0,140
Life Control	-0,218	0,002	-0,125	-0,091	-0,006	-0,118
Purposes in life	<b>-0,347</b> p=0,071	-0,252	-0,323	-0,261	0,016	-0,155
Locus of control – Self	<b>-0,349</b> p=0,068	-0,161	-0,144	-0,201	-0,153	-0,281
Total score	-0,300	-0,170	-0,198	-0,180	-0,060	-0,105

Note: \* – significance level  $p \leq 0.05$ ; \*\* – significance level  $p \leq 0.01$ ; \*\*\* – significance level  $p \leq 0.001$



Correlation coefficients between indicators of problematic use of social media (PFUS) and the scales of Depression, Anxiety, and Stress Scale (DASS-21) in Group A with pronounced signs of problematic social media use (n=62)

	<b>PFUS Total score</b>	<b>Preference for online social interaction</b>	<b>Mood regulation</b>	<b>Cognitive preoccupation</b>	<b>Compulsive use</b>	<b>Negative outcomes</b>
<b>Depression</b>	0,235	-0,046	0,196	0,066	0,177	<b>0,289*</b>
<b>Anxiety</b>	<b>0,377**</b>	-0,076	0,240	0,224	0,162	<b>0,338**</b>
<b>Stress</b>	<b>0,342**</b>	-0,051	<b>0,375**</b>	0,146	0,081	<b>0,384**</b>

Note: \* – significance level  $p \leq 0.05$ ; \*\* – significance level  $p \leq 0.01$ ; \*\*\* – significance level  $p \leq 0.001$

Correlation coefficients between indicators of problematic use of social media (PFUS) and the scales of Depression, Anxiety, and Stress Scale (DASS-21) in Group B with minimal expression of signs of problematic social media use (n=28)

	<b>PFUS Total score</b>	<b>Preference for online social interaction</b>	<b>Mood regulation</b>	<b>Cognitive preoccupation</b>	<b>Compulsive use</b>	<b>Negative outcomes</b>
<b>Depression</b>	0,275	<b>0,499**</b>	0,227	0,223	0,226	-0,042
<b>Anxiety</b>	<b>0,437*</b>	<b>0,374*</b>	0,345	0,361	0,107	0,357
<b>Stress</b>	0,348	0,369	0,262	<b>0,379*</b>	0,019	0,243

Note: \* – significance level  $p \leq 0.05$ ; \*\* – significance level  $p \leq 0.01$ ; \*\*\* – significance level  $p \leq 0.001$

Correlation coefficients between indicators of problematic use of social media (PFUS) and the scales of Emotional Empathic Tendency Scale (EETS) in Group A with pronounced signs of problematic social media use (n=62)

Шкалы Опросника эмоциональ- ной эмпатии (EETS)	PFUS Total score	Preference for online social interaction	Mood regulation	Cognitive preoc- cupation	Compul- sive use	Negative outcomes
Exposure to emotional contamination	-0,008	0,041	-0,063	0,019	0,101	-0,033
Emotional sensitivity	-0,178	0,003	-0,147	-0,189	0,032	<b>-0,230</b> p=0,072
Understanding and respecting the feelings of others	0,157	0,146	0,192	-0,073	0,093	-0,033
Emotional responsiveness	0,117	0,048	-0,128	0,061	0,155	0,104
Willingness to become involved in other people's problems	0,095	0,032	0,099	0,100	0,130	-0,028
Compassion	<b>-0,455**</b>	-0,194	-0,180	<b>-0,249*</b>	-0,140	<b>-0,375**</b>
Empathy	0,073	-0,033	<b>0,347**</b>	0,137	-0,136	-0,061

Note: \* – significance level  $p \leq 0.05$ ; \*\* – significance level  $p \leq 0.01$ ; \*\*\* – significance level  $p \leq 0.001$

Correlation coefficients between indicators of problematic use of social media (PFUS) and the scales of Emotional Empathic Tendency Scale (EETS) in Group B with minimal expression of signs of problematic social media use (n=28)

Шкалы Опросника эмоциональ- ной эмпатии (EETS)	PFUS Total score	Preference for online social interaction	Mood regulation	Cognitive preoc- cupation	Compul- sive use	Negative outcomes
Exposure to emotional contamination	<b>-0,407*</b>	-0,245	<b>-0,375*</b>	-0,057	-0,281	-0,103
Emotional sensitivity	-0,151	-0,285	-0,292	0,052	0,014	-0,030
Understanding and respecting the feelings of others	0,039	0,145	0,148	-0,093	<b>0,323</b> p=0,093	-0,134
Emotional responsiveness	-0,359	-0,200	-0,109	<b>-0,446*</b>	-0,158	-0,293
Willingness to become involved in other people's problems	-0,092	-0,230	-0,181	-0,242	-0,057	-0,032
Compassion	-0,103	-0,013	-0,100	0,087	-0,278	-0,023
Empathy	0,295	0,108	0,288	0,160	0,190	0,283

Note: \* – significance level  $p \leq 0.05$ ; \*\* – significance level  $p \leq 0.01$ ; \*\*\* – significance level  $p \leq 0.001$