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Psychological Determinants of Adaptability at the University in First-Year Students of the Faculty of Medicine During the COVID-19 Pandemic

Daria S. Gnedykh[1]✉, **Marina A. Tikhomirova**[2], **Maria V. Iakovleva**[3]
[1, 2, 3] St Petersburg State University, Saint Petersburg, Russian Federation

✉ d.gnedyh@spbu.ru

Abstract: **Introduction**. The successful adaptation of university students determines their participation in educational activities, their effectiveness, and a positive attitude toward the chosen profession. The novelty of the research is to study the adaptability of students in the transition to new, often unusual, forms of education (online, distance) against the backdrop of an increase in the general level of anxiety during the COVID-19 pandemic. Such difficulties significantly affected students of medical specialities, the development of which implies the formation of competencies in practical activities. **Methods**. The study involved students of medical (N = 93) and economic (control group, N = 111) faculties. The following methods were used: "Method of Research of Students Adaptability in the Higher Educational Establishment" by T. D. Dubovitskaya, A. V. Krylova, "The Satisfaction with Life Scale" by E. Diener, "Test of neuropsychic adaptation" by I. N. Gurvich, "Educational strategies" by S. N. Kostromina, T. A. Dvornikova, "Students' educational motivation diagnostic inventory" by N. C. Badmaeva, "The Big Five Inventory" adapted by D. P. Yanichev, "The State-Trait Anxiety Inventory (STAI)" adapted by A. P. Bizyuk et al. (Part 2). **Results and Discussion**. The psychological characteristics of the Faculty of Medicine first-year students, contributing to the adaptability at the university during the COVID-19 pandemic, include a high level of extraversion, willingness to cooperate, the presence of professional motives for learning and motivation to achieve success, a high level of neuropsychic adaptation, orientation to memorizing educational material and a disinclination to planning educational activities. For students of the Faculty of Economics, such predictors were a great life satisfaction, a high level of extraversion, a low level of anxiety, motives for creative self–realization and a desire for planning in training. Students of the Faculty of Medicine with a high level of adaptability, in comparison with highly adapted students of the Faculty of Economics, have more pronounced professional motives and more often resort to the strategy of repeating educational material. Such differences may be due to both the peculiarities of the organization of the educational process and the specifics of the chosen speciality.

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Keywords: COVID-19 pandemic, university adaptability, information and communication technologies, university students, learning motivation, learning strategies, life satisfaction, neuropsychic adaptation, anxiety, medical education

Highlights:

- The psychological determinants of adaptation at the university during the COVID-19 pandemic specific for first-year students of the Faculty of Medicine (in comparison with the Faculty of Economics students) are: professional motives for learning, motivation for success, willingness to cooperate, assimilation of educational material through repetition, avoidance of planning educational activities.
- The psychological characteristics that determine the high level of adaptability of students at the university (regardless of the field of study) are emotional well-being and a high level of extraversion.
- Higher adaptability at the university during the COVID-19 pandemic was revealed in students of the Faculty of Medicine compared with Faculty of Economics students.

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Introduction

Adapting to study at the university is a significant stage in every student's life on the way to mastering the profession. It includes both familiarity with new rules and responsibilities, training load, regime, and new environment, team, and forms of training (Siomichev, 1985). All of this requires a certain level of independence and activity of the student, emotional stability, and the ability to cope with the stress associated with information overload. The result of adaptation is the achievement of a balance between the social and personal characteristics of the student and the new conditions of the university environment (Grishanov & Tsurkan, 1990).

The satisfaction of students with the university, their immersion in studies, and the success of their studies depend on how successfully this stage is passed (Shcherbakov et al., 2018; Xie et al., 2019; Raza et al., 2021), as well as a positive attitude toward the chosen profession (Rubin & Kolesnikov, 1968). A low level of adaptation, manifested in the presence of academic problems, anxiety, and even depressive states, leads to a drop in academic performance (Iglesias-Benavides et al., 2016) and increases the risk of further expulsion of a student from a higher educational institution.

It is especially significant to provide better conditions for students to adapt to learning activities during the COVID-19 pandemic because a tense situation can increase their overall level of anxiety, leading to a decrease in learning outcomes and adaptive abilities (Baloran, 2020; Rajab et al., 2020; Son et al., 2020; Okado et al., 2021). In addition, applicants who entered higher education institutions in 2021 found themselves in a situation of blended learning, when classes were held simultaneously both in classrooms and online or remotely, which is specific to the already established traditional (offline) education system.

The use of distance learning technologies in medical universities causes a unique discussion.

On the one hand, studies show that online lectures have proven themselves well in medical education (Cardall et al., 2008; Remtulla, 2020). In addition, there are mobile applications that allow you to study human anatomy using 3D computer models. Virtual reality technologies are also actively being introduced into the educational process, allowing the reconstruction of the clinical environment in which students can examine, diagnose, and treat patients in situations simulated by the program. A review of studies on the use of virtual reality in medical training has shown that such tools contribute to improving learning outcomes (Samadbeik et al., 2018). However, given the specifics of the profession, the format of distance learning (DL) may not always be productive or appropriate in a medical university (Timofeeva, 2021). Virtual reality technologies still cannot replace practice and should act only as an additional teaching method (Walsh et al., 2012; Khan et al., 2014; Moghaddasi et al., 2016). This conclusion is also reached by Krasnoselskikh et al., as a result of a survey of medical university students and teachers devoted to their attitude to the introduction of DL in the professional training of doctors – "it is advisable to use distance learning technologies in combination with traditional educational and methodological tools" (Krasnoselskikh et al., 2020, p. 111). According to the students themselves, DL should be combined with real communication with teachers and cannot be an alternative to some traditional forms of education (ibid.). However, considering the physical distancing of students from some educational resources (for example, laboratories) forced during the pandemic, scientists urge not to abandon the use of online resources if they can provide active learning (Sandrone & Schneider, 2020).

In the context of the forced transition to online and distance learning during the COVID-19 pandemic, it becomes significant to consider factors that help students adapt to a new form of work. The conducted research in this area indicates that successful adaptation is ensured by the presence of students' self-regulation skills and socio-emotional competencies (the ability to relieve tension and reduce the intensity of experiencing social and emotional loneliness) (Händel et al., 2020; Flores et al., 2022). These skills of first-year students have not yet reached a high level, increasing the risk of unsuccessful adaptation to distance and online learning. As was shown in a comparative study of medical university students conducted by Timofeeva (2021), junior students experience a lack of adaptability, which increases in the third year and decreases again in the fourth year of study.

Studies devoted to the search for factors and resources that contribute to the adaptation of first-year students to higher education were conducted long before the pandemic. Such factors include low levels of stress, availability of social support (from friends and family), adequate self-esteem (Friedlander et al., 2007), lack of communication difficulties, the ability to manage time, the availability of learning skills (Ababu et al., 2018), autonomous motivation and self-efficacy (Girelli et al., 2018; Sadoughi, 2018). Personality characteristics determine the ability of students to adapt. For example, perfectionism and the "impostor phenomenon" (the tendency of people with high achievements to chronically doubt their abilities and fear that others will discover that they are "intellectual scammers") (Henning et al., 1998) negatively affect the adaptability of students.

In several studies, it has been observed that motivation for learning plays an important role in adaptation. Students who have expressed cognitive and professional motives adapt to learning more successfully (Lokatkova, 2012). Unmotivated students, on the contrary, have a low level of psychosocial adaptation to higher education (Baker, 2004). Regarding distance learning, it was also revealed that educational motivation and formed learning strategies are positively associated

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with the success of students' learning activities, which, according to the authors, contributes to their adaptation to higher education (Wang et al., 2008). As a result of the study of psychological, motivational and behavioral factors influencing the academic adaptation of students, Raza et al. (2021) conclude that the greatest contribution to this process is made by motivation for learning and self-regulation skills.

Therefore, numerous studies emphasize the role of both the personality characteristics of students in the process of adaptation to higher education and the presence of certain social and environmental factors that contribute to its success.

In this study, we addressed the question of what role these factors play in the adaptation process of first-year medical students who begin their studies at a university in a blended format (including classroom, online or distance classes). Based on the analysis of scientific sources presented above, in order to identify individual psychological characteristics that determine the success of the adaptation of first-year students to study at a university during the COVID-19 pandemic, we selected the following variables: subjective life satisfaction, neuropsychic adaptation, learning strategies (cognitive and metacognitive), learning motivation and some personal characteristics of students, including anxiety.

A control group included the first-year students of the Faculty of Economics, who also began their studies in similar conditions – in a blended learning – caused by the epidemiological situation in the country and the world, was included in the study to detect the determinants of adaptability at the university, specific to medical students.

Methods

The study was conducted in the spring semester of 2021 at St Petersburg State University. The main group of the study included 93 first-year students of the Faculty of Medicine. The control group included 111 first-year students in the Faculty of Economics. Respondents agreed to participate in the study.

The study participants filled out psychodiagnostic methods presented in Google Forms format and aimed at identifying adaptability in higher education (the psychodiagnostic technique "Method of Research of Students Adaptability in the Higher Educational Establishment" (Dubovickaya & Krylova, 2010)), mental state ("Test of neuropsychic adaptation" by I. N. Gurvich (Ovchinnikov et al., 2005) and "The State-Trait Anxiety Inventory (STAI)", Part 2 (Bizyuk et al., 2005)), life satisfaction (E. Diener's "The Satisfaction with Life Scale" (Osin & Leont'ev, 2020)), learning motives ("Psychodiagnostic technique for diagnosing students' educational motivation" in the adaptation by N. Ts. Badmaeva (Badmaeva, 2004)), educational strategies (questionnaire "Educational strategies" (Dvornikova, 2017)), personality characteristics ("The Big Five Inventory" in the adaptation by D. P. Yanichev (Yanichev, 2006)).

Statistical data processing was carried out using stepwise regression and comparative (Mann–Whitney U test) types of analysis in the SPSS Statistics 26.0 program.

Results and Discussion

As a result of processing empirical data, it was revealed that the level of adaptation of medical students at the university is mainly medium or high. Therefore, the high level was recorded in 39 people, which is 42 % of the total number of subjects (1st subgroup), the average – in 43 people (46 %) (2nd subgroup), the low – in 11 people (12 %) (3rd subgroup).

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Based on the results of the comparative analysis, we also found differences in individual psychological characteristics of students with high, medium, and low levels of adaptability in the university. Thus, students in the 1st subgroup, compared to students in the 3rd subgroup, have statistically higher life satisfaction ($p = 0.001$), level of extraversion ($p = 0.003$), self-awareness ($p = 0.002$), willingness to consent and cooperate (agreeableness) ($p \leq 0.001$), emotional stability ($p = 0.003$), personality resources (openness) ($p = 0.017$), the level of neuropsychic adaptation ($p \leq 0.001$), as well as a more developed strategy for mastering educational material, such as repetition ($p = 0.04$). At the same time, they have a lower overall indicator of trait anxiety ($p = 0.002$), a phobic component of anxiety ($p = 0.001$) and a component of "anxious perspective assessment" ($p = 0.002$), as well as avoidance motives ($p = 0.003$).

It is significant to note that such personality characteristics as extraversion ($p \leq 0.001$) and level of conscientiousness ($p = 0.017$) are also statistically significantly higher in students of the 1st subgroup compared to students of the 2nd, with statistically lower rates of ineffective adaptation ($p = 0.013$) and avoidance motives ($p = 0.023$).

The following differences are observed between students from the 2d and 3rd subgroups. Students with a medium level of adaptability are more satisfied with their lives ($p = 0.05$), are willing to cooperate ($p = 0.013$), have greater emotional stability ($p = 0.034$) and have personality resources to solve problems ($p = 0.05$), and more often resort to repetition strategies in training ($p = 0.022$). At the same time, they generally show lower trait anxiety ($p = 0.02$), have less pronounced phobic manifestations of anxiety ($p = 0.021$) and symptoms of misadaptation ($p = 0.01$) and are less anxious about their prospects ($p = 0.014$).

Thus, students in the 1st year of the Faculty of Medicine who are less adapted to the university are more likely to worry about upcoming events, negatively assess their chances of success, have more pronounced symptoms of neuropsychiatric misadaption, study to avoid censure and condemnation from others, and not to gain new knowledge. Such students are less satisfied with their lives, more withdrawn, and tend to cope with difficulties on their own without seeking help. Perhaps this is due to their greater neuroticism (or low emotional stability), closeness to new experiences, and fewer personality resources to overcome stressful situations.

Regression analysis was performed to identify psychological predictors of students' adaptability at the university. The dependent variable was the level of adaptability at the university, the scales of other questionnaires were independent variables. The significant regression model ($R^2 = 0.57$) included the following variables: 'extraversion' ($\beta = 0.29$, $p \leq 0.01$), 'agreeableness' ($\beta = 0.39$, $p \leq 0.001$), 'neuropsychic adaptation' ($\beta = –0.06$, $p \leq 0.05$), 'avoidance motives' ($\beta = –2.43$, $p \leq 0.001$), 'professional motives' ($\beta = 1.45$, $p \leq 0.05$), cognitive learning strategy 'repetition' ($\beta = 0.32$, $p \leq 0.05$), metacognitive learning strategy 'planning' ($\beta = –0.20$, $p \leq 0.05$). Thus, those students who show interest in other people are ready for cooperation and discussion while being in an optimal, healthy mental state, motivated to obtain professionally necessary competencies, ready to memorize and repeat the material, tuned to action and not just planning, will be better adapted at the university. These data correlate with the results of studies obtained before the pandemic – pronounced professional motives (Lokatkova, 2012) and a focus on communication (Ababu et al., 2018) generally contribute to better adaptation of first-year students at the university.

More than half of the students included in the control group (first-year students of the Faculty of Economics) have an average level of adaptability at the university (65 people, 59 %), almost a quarter of students have a low level (27 people, 24 %), and the smallest group consisted of

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students with a high level of adaptability at the university (19 people, 17 %).

Students of the Faculty of Economics with a high (subgroup 1), medium (subgroup 2) and low (subgroup 3) level of adaptability also have the statistically significant difference in some individual psychological characteristics. That is, students in 1st subgroup have higher indicators of life satisfaction ($p = 0.02$), conscientiousness ($p = 0.05$), personality resources (openness) ($p = 0.015$), their professional motives for learning activities are more pronounced ($p \leq 0.04$), as well as metacognitive learning strategies ($p = 0.038$), observation strategy in particular ($p = 0.024$); at the same time, self-doubt, a feeling of an uncertain, vague threat ($p = 0.011$), and symptoms of neuropsychic maladjustment ($p = 0.034$), are less pronounced, compared to students of the 2nd subgroup.

The differences are clearly observed when comparing subgroups of economics students with a high and a low level of adaptation. Students in the 1st subgroup have significantly higher life satisfaction ($p = 0.001$), extraversion ($p = 0.003$), conscientiousness ($p = 0.025$), emotional stability ($p = 0.01$), personality resources (openness) ($p = 0.01$), motives for learning activities such as prestige ($p = 0.024$), professional ($p = 0.036$), educational and cognitive ($p = 0.002$) motives, motives for creative self-realization ($p = 0.003$), cognitive ($p = 0.01$), and metacognitive ($p = 0.001$) learning strategies. Trait anxiety ($p \leq 0.001$), and all its components ($p \leq 0.05$), are statistically significantly lower. However, its 'social protection' component ($p = 0.118$) is higher, as well as neuropsychic adaptation ($p = 0.001$).

The psychological predictors of university adaptation in the control group were ($R^2 = 0{,}38$): 'life satisfaction' ($\beta = 0.16$, $p \leq 0.075$), 'extraversion' ($\beta = 0.26$, $p \leq 0.01$), 'general level of anxiety' ($\beta = -0.28$, $p \leq 0.01$), motives for creative self-realization ($\beta = 0.17$, $p \leq 0.05$), and metacognitive learning strategy 'planning' ($\beta = 0.14$, $p \leq 0.092$). In other words, students who are satisfied with their lives, open to new experiences and other people, less anxious, able to realize their creative potential and to plan their educational activities, will adapt more successfully at a university. It is of interest that the cognitive learning strategy 'planning' negatively affects the adaptability of medical students and positively affects the adaptability of economics students. This may be due to the specifics of the academic disciplines and the organization of the learning process in these areas of vocational education. The first year of education at the faculty of medicine is based on the development of practical professional skills (work in laboratories, on mockups, simulators, and the like; Isaeva & Gabidullina, 2018; Kamyshnikova et al., 2019; Shanks et al., 2010). Its success will be determined to a greater extent by the ability to quickly navigate and take active steps to master the course of study and not by the ability to long-term plan own educational activities.

When comparing the individual psychological characteristics of the students in two faculties, the following differences were discovered. Students in the Faculty of Medicine are better adapted to a university than students in the Faculty of Economics ($p \leq 0.001$), to their study group ($p = 0.01$), and to the learning activity itself ($p \leq 0.001$). Furthermore, they have a higher level of conscientiousness ($p = 0.005$), and the motives for learning are more pronounced: professional ($p \leq 0.001$), educational and cognitive ($p \leq 0.001$), social ($p \leq 0.004$), creative self-realization ($p = 0.034$); cognitive ($p \leq 0.001$), and metacognitive ($p \leq 0.001$) learning strategies, are more developed. One can assume that these values indicate greater motivation for learning in students of the Faculty of Medicine, as well as their better instrumental readiness for the educational process. Indeed, according to some data, medical students are attracted by the social significance of their chosen profession; therefore, most make a choice in its favor on their own (not under the influence of

their immediate environment, which are parents or friends) (Karabinskaya et al., 2010).

However, the comparative analysis of the individual psychological characteristics of the subgroups of students with a high level of adaptability at a university did not reveal any differences between them. It is, except for the greater expression of professional motives among medical students ($p = 0.004$), and the learning strategy of repetition ($p = 0.023$). It may be due to their initially more pronounced professional motivation, as well as the specifics of educational activities, in which students in the medical faculty spend more time preparing for classes, studying the basics of various disciplines, during which it is important to memorize a large amount of information. According to Meermanova et al. (2017), the teaching load in the medical field is higher than, for example, in technical universities. It forces students to spend more time repeating studied material. In this regard, it may lead to the predominance of this learning strategy in them.

Among students with a low level of adaptation in a university, there are more differences: medical students, compared to economics students, have more pronounced social ($p = 0.014$), educational and cognitive ($p = 0.002$), avoidance ($p = 0.049$), prestige ($p = 0.004$) motives. They also have better developed various learning strategies ($p = 0.016$). Additionally, students in the faculty of medicine have a higher indicator of anxiety assessment of prospects ($p = 0.041$), and a lower indicator of agreeableness ($p = 0.041$).

The data obtained indicate the versatility of psychological parameters characteristic of well-adapted students, in the presence of specific individual characteristics, depending on the professional orientation of students.

Findings

The results of the study of the level, characteristics and predictors of the adaptability of first-year medical students in a university after the transition to a blended learning format due to the COVID-19 pandemic allow one to formulate the following conclusions and recommendations:

1. First-year students of the faculty of medicine are generally characterized by a sufficient level of adaptation at a university (88% of respondents). The indicator in this group is higher than in the group of students of training direction. Successful coping with a stressful (and new) situation of studying at a university, including associated with a blended format of education during an unfavorable epidemic situation, can be due both to the peculiarities of the organization of the educational process, which contributes to increasing the adaptability of students, and to the specifics of this contingent of students – their personality traits, level of stress resistance and frustration tolerance, mature motivation, and self-organization skills.

2. Comparison of the psychological characteristics of students of various areas of training with a high level of adaptation at a university allow one to draw a conclusion that a number of such characteristics are of a universal nature, while some of them are specific to different contingents of students. That is, students successfully adapted in a university are characterized by a higher level of life satisfaction, extraversion, conscientiousness, emotional stability, personality resources (openness), and neuropsychic adaptation. In this group, the indicators of trait anxiety and a diseased neuropsychic state are also significantly lower. The specific characteristics that distinguish highly adapted first-year students of the medical faculty (compared to students of the economic direction) include a greater expression of professional motives and more frequent use of the repetition strategy in educational activities.

3. Psychological determinants of university adaptability of first-year students during the

COVID-19 pandemic are different depending on the field of study. For first-year students of the faculty of medicine, such determinants are: willingness to cooperate, agreeableness, a high level of extraversion and neuropsychic adaptation, the presence of professional motives for learning activities and the motivation to achieve success, and an orientation towards memorizing educational material. Moreover, they are not characterized by planning educational activities. Among students of the faculty of economics, the psychological characteristics that determine adaptability at a university are: the presence of motives for creative self-realization, a high level of extraversion, life satisfaction, a low level of anxiety, and a desire for planning in learning. Therefore, the level of extraversion is the only characteristic included in the predictive models of student adaptation at a university, both in the group of students studying medical and economic specialties.

4. The stressfulness of situation when starting studies at a university, especially during an unfavorable epidemic situation associated with a constant change in the format of education and other organizational, social and psychological difficulties, leads to the need to consider the possibility of providing students with prompt and qualified psychological support. Currently, many universities are implementing programs of free psychological assistance for students, contributing to their rapid adaptation to the new educational environment. This type of psychological work can be conducted in various formats: psychological support, psychological counseling, psychological intervention – depending on the needs of students themselves.

5. The results of the study allow one to formulate the main targets of psychological counseling in the group of students with a high risk of maladaptation at a university: 1) it is necessary to pay attention to the severity of symptoms of low adaptation, general psychological distress of students, including physical and emotional ones, associated with sleep problems, vegetative-somatic disorders, emotional lability, and dysthymia; 2) the object of diagnosis and correction, if necessary, can be a high level of trait anxiety, including the one associated with increased physical and mental fatigue, with an anxious assessment of the prospect, with unstable self-esteem against the background of increased demands on oneself, and an increased need to control the situation; 3) special attention should be paid to the low level of students' personality resources for coping with stressful situations, including low agreeableness, closeness to new experience, low self-organization, unwillingness to accept and positively evaluate changes, unwillingness to seek social (emotional) support from other people, withdrawal into oneself.

In addition to psychological support programs for students, there is an additional resource to increase their adaptability in a university. It is training programs aimed at optimizing learning strategies, teaching self-organization skills and coping with learning difficulties, increasing awareness of activity and learning motivation.

Conclusion

The success (efficiency) of activities, including educational ones, the sense of one's own competence, the level of adaptation (at a university and life in general) are associated with a wide range of factors: external, situational (circumstances of a particular situation and its requirements), and internal, which include individual characteristics of a student: personality traits, value-motivational characteristics, features of emotional response, and existing experience in implementation of activities. Factors as a whole should be considered in the correctional and development work with students.

As a result of the study on the contingent of students in the medical field, certain personality

characteristics of students and the learning strategies they use were revealed to be associated with a greater probability of successful adaptation in a university during the period of change in education format due to the COVID-19 pandemic. Students characterized by a low severity of these traits can be considered as a risk group prone to low adaptability at a university, especially during critical periods of increased workload, sudden changes, and specific requirements. They need special attention and, if necessary, psychological counseling.

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Author Contributions

D. S. Gnedykh developed the study design and methodology, conducted statistical analysis of the data, prepared the text of the article, and performed the final editing of the text of the article.

M. A. Tikhomirova participated in the selection and preparation of methodological tools, collected empirical data, performed primary data processing, analyzed the results and described them, and performed the final editing and formatting of the text of the article.

M. V. Iakovleva developed the study design, interpreted the data, and edited the text of the article.

Author Details

Daria Sergeevna Gnedykh – Cand. Sci. (Psychology), Associate Professor of the Department of Educational Psychology and Pedagogy, St Petersburg State University, St. Petersburg, Russian Federation; Scopus Author ID: 56955557500, ResearcherID: N-1299-2015, SPIN-code: 3956-6227, ORCID: https://orcid.org/0000-0003-4955-4779; e-mail: d.gnedyh@spbu.ru

Marina Anatol'evna Tikhomirova – Cand. Sci. (Psychology), Associate Professor of the Department of Educational Psychology and Pedagogy, St Petersburg State University, St. Petersburg, Russian Federation; Scopus Author ID: 57205217060, ResearcherID: E-4940-2018, SPIN-code: 1607-2398,

ORCID: https://orcid.org/0000-0001-5940-8367; e-mail: m.tikhomirova@spbu.ru
Maria Viktorovna Iakovleva – Cand. Sci. (Psychology), Associate Professor of the Department of Medical Psychology and Psychophysiology, St Petersburg State University, St. Petersburg, Russian Federation; Scopus Author ID: 57189905578, ResearcherID: E-5453-2017, SPIN-code: 5168-9633, ORCID: https://orcid.org/0000-0001-5035-4382; e-mail: m.v.yakovleva@spbu.ru

Conflict of Interest Information

The authors have no conflicts of interest to declare.