The Peerian Journal
Open Access | Peer Reviewed
Volume 42, May, 2025
ISSN (E): 2788-0303
Website: www.peerianjournal.com
Email: editor@peerianjournal.com

Psychological Resilience As A Factor In The Prevention Of Depression Among Adolescents And Youth In The Digital Environment

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Resume,
This article addresses the need to develop and implement a multifactor model for the early prevention of depressive disorders in adolescents and young adults. Given the polyetiological nature of depression in youth, the study focuses on the integration of psychoemotional, social, and neurobiological risk factors.
Directions for screening and early intervention are presented, including the assessment of emotional regulation, family environment, digital stress, and neuropsychological traits.
The effectiveness of an interdisciplinary approach in building resilience against depression is substantiated.
Keywords: Depression, youth, prevention, resilience, social factors, neurobiology

Мультифакторная Модель Ранней Профилактики Депрессивных Расстройств В Молодом Возрасте: Психоэмоциональные, Социальные И Нейробиологические Детерминанты

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Резюме,
В статье рассматривается необходимость разработки и внедрения мультифакторной модели ранней профилактики депрессии у подростков и молодёжи.
Учитывая, что депрессивные расстройства в молодом возрасте имеют полиэтиологическую природу, в работе акцент сделан на интеграции психоэмоциональных, социальных и нейробиологических факторов риска.
Представлены направления скрининга и раннего вмешательства, включая оценку эмоциональной регуляции, среды воспитания, цифровой нагрузки и нейропсихологических особенностей. Обоснована эффективность междисциплинарного подхода в формировании устойчивости к депрессии.
Ключевые слова: депрессия, молодёжь, профилактика, резильентность, социальные факторы, нейробиология.

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Yosh Davrida Depressiv Buzilishlarning Erta Profilaktikasi Bo‘Yicha Multifaktorli Model: Psixoemotsional, Ijtimoiy Va Neyrobiologik Determinantlari

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Rezyume,

Ushbu maqolada o‘smirlar va yoshlarda depressiv buzilishlarning oldini olish uchun multifaktorli erta profilaktika modelini ishlab chiqish zarurligi ko‘rib chiqiladi.

Depressiya yosh davrida turli sabablarga bog‘liq holda shakllanishini hisobga olib, psixoemotsional, ijtimoiy va neyrobiologik xavf omillarining integratsiyasi tahlil qilinadi.

Tadqiqotda emotsional regulyatsiya, oilaviy muhit, raqamli yuklama va neyropsixologik xususiyatlarni baholash asosida skrining va erta aralashuv yo‘nalishlari bayon etiladi.

Depressiyaga qarshi barqarorlikni shakllantirishda fanlararo yondashuvning samaradorligi asoslab beriladi.

Kalit so‘zlar: depressiya, yoshlar, profilaktika, barqarorlik, ijtimoiy omillar, neyrobiologiya

Relevance. Depression in adolescents and young people is one of the most common forms of psychoemotional disorders that pose a serious threat to personal and cognitive development, as well as social functioning at an early age [1, 2]. According to the World Health Organization, depression is one of the top three causes of disability in people aged 15 to 24 years [3]. From 20 to 40% of young people in the world experience symptoms of depression at one time or another, and only a small part of them receive timely help [4, 5]. Modern research emphasizes that depressive disorders at a young age have a multifactorial nature, forming at the intersection of psychoemotional, social, family and neurobiological factors [6-8]. In the context of digitalization, post-teen instability and the growth of social stressors, the vulnerability of young people to the formation of anxiety-depressive states increases significantly [9, 10]. It has been found that phenomena such as cyberbullying, digital addiction, FOMO syndrome, and information overload significantly increase the risk of depression in adolescents [11]. Psychoemotional determinants, including unstable self-esteem, low emotional regulation, alexithymia, and a chronic sense of loneliness, turn out to be systemically associated with increased symptoms of depression [12, 13]. Social and family factors, such as maladaptive parenting style, lack of support, and conflicts in the environment, significantly reduce resistance and resistance to stress [14]. From the point of view of neurobiology, hyperactivity of the hypothalamus-pituitary-adrenal axis (HPA), elevated cortisol levels, serotonin deficiency, and decreased plasticity of the prefrontal cortex and hippocampus are recognized as key biomarkers of early vulnerability to depression [15, 16]. However, only a few studies combine these three dimensions — psychoemotional, social, and neurobiological — into a single system of preventive analysis. In this

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regard, there is a need to build a multifactorial model of early prevention of depression in young people, which allows assessing individual risk and developing personalized intervention programs [17]. Such a model should take into account a range of influences, including behavioral markers, emotional disorders, social conditions, and biological predisposition, thereby contributing to reducing the prevalence of depressive disorders and increasing the mental health resilience of the younger generation.

Depressive spectrum disorders in adolescents and youth are currently considered as one of the key global threats to the mental health and personal development of the younger generation [1, 2]. According to the WHO report for 2023, more than 25% of young people in the world experience episodes of depression or a subdepressive state, and 60% of them have a relapse in during the first 12 months [3]. Especially alarming is the downward trend in the age of the first episode of depression — in recent years it has been increasingly recorded as early as 13-15 years [4]. Modern research shows that depression in adolescents and students is multifactorial in nature: it is formed under the simultaneous influence of psychoemotional, social and neurobiological factors [5, 6]. On the one hand, the key psychoemotional determinants include chronic anxiety, unstable self-esteem, insufficient formation of emotional regulation skills, and alexithymia [7, 8].

On the other hand, social and family factors play a significant role: emotional neglect, lack of support, overprotection, an unfavorable educational climate, and conflictual relationships with parents and peers [9, 10]. Along with this, numerous studies in recent years have focused on the increasing influence of the digital environment. Teenagers who spend more than 4-5 hours a day on social media demonstrate significantly higher levels of depression and anxiety, especially in the presence of cyberbullying, digital burnout, and FOMO syndrome (fear of missing out on important things) [11, 12]. From the point of view of neurobiology, the concept of neurodevelopment of depression is becoming more and more confirmed, in which disorders in the hypothalamus-pituitary-adrenal (HPA-axis) system, neurotransmitter deficiency (in particular, serotonin, dopamine) and decreased neuroplasticity form the physiological basis of emotional vulnerability in adolescence [13, 14]. New neuroimaging data (fMRI, DTI) indicate functional changes in the prefrontal cortex, amygdala, and hippocampus in adolescents with clinical and subclinical depression [15]. The COVID-19 pandemic, growing social instability, digitalization, and identity crises have increased the manifestations of the anxiety-depressive spectrum among young people around the world [16]. In these conditions, the task of creating multifactorial models of depression prevention based on a comprehensive assessment of individual risk, including psychoemotional characteristics, the level of social support and neurobiological vulnerability, becomes especially urgent [17]. Thus, the development and implementation of a scientifically based multifactorial model of early prevention of depressive disorders at a young age is a priority area of modern psychology, psychiatry and preventive medicine.

The purpose of the study. To develop and scientifically substantiate a multifactorial model of early prevention of depressive disorders in adolescents and youth based on a comprehensive assessment of psychoemotional, social and neurobiological risk factors, as well as to identify key protective and vulnerable determinants that make it possible to identify high-risk groups and direct preventive measures to the individual psychophysiological characteristics of a young person.

Materials and methods of research. The study was of a comprehensive, observational and analytical nature and was conducted in 2022-2024 on the basis of educational institutions and

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medical counseling and psychological centers in the city of Andijan. The study included adolescents and youth aged 15 to 22 years. The total sample consisted of 384 participants (218 girls and 166 boys) who met the inclusion criteria.

The results of the study. Multifactorial model of early prevention of depressive disorders at a young age: psychoemotional, social and neurobiological determinants The study involved 384 respondents aged 15 to 22 years (the average age was 18.3 ± 1.9 years), of which 218 (56.8%) were girls and 166 (43.2%) were boys. All participants were students of colleges, lyceums or universities. According to the results of a comprehensive psycho-emotional and neurophysiological examination, the following data were obtained: 1. Severity of depressive symptoms (on a PHQ-9 scale) Among all participants, 215 people (56%) showed signs of depression of varying degrees: mild depression (5-9 points): 104 respondents (27.1%) moderate depression (10-14 points): 79 respondents (20.6%) severe depression (15-19 points): 26 people (6.8%) severe depression (≥20 points): 6 people (1.5%) The remaining 169 people (44%) showed a normal level (<5 points). Girls were more likely to show moderate and severe forms of depression (a total of 32.1% versus 22.3% in boys; $p < 0.05$). 2. Psychoemotional indicators According to the Spielberger anxiety scale, 59.3% of participants had an increased level of situational anxiety, and 48.6% had a high level of personal anxiety. Correlation analysis showed a moderately strong positive relationship between anxiety and the level of depression ($r = 0.52$; $p < 0.01$). A low level of emotional self-regulation on the ERS scale was observed in 44% of the surveyed, while it was significantly more common in the group with severe depression ($p < 0.01$).

There were also signs of alexithymia in this group — difficulty identifying emotions, poor awareness of internal states. 3. Social factors Factors of family instability were present in 61% of cases with depressive symptoms. Among them: emotional neglect – 29.8%, pronounced parental control – 22.7%, lack of support – 19.1%. The presence of persistent conflicts with parents or peers significantly increased the risk of depression ($p < 0.01$). The level of social support (according to the questionnaire) was significantly lower in adolescents with PHQ-9 ≥ 10, compared with others ($p < 0.05$). 4. Digital behavior and addiction The average time spent on the Internet is 4.7 ± 1.8 hours per day. 71% of the participants showed moderate or severe digital dependence: moderate digital dependence — 54.3% , high digital dependence — 16.7% (more than 60 points on the Young scale) , A strong positive correlation was established between the level of digital dependence and PHQ-9 scores ($r = 0.48$; $p < 0.01$), as well as between the time spent in social networks and anxiety ($r = 0.41$; $p < 0.01$). Adolescents who experienced cyberbullying ($n = 68$) showed significantly higher levels of depression and anxiety ($p < 0.01$), as well as lower rates of resistance. 5. Psychological stability (resilience) On the CD-RISC-25 scale: high level of resilience (>70 points) — 71 participants (18.5%) average (51-70 points) — 184 (47.9%) low (<50 points) — 129 people (33.6%) The level of resilience was inversely correlated with the severity of depression ($r = -0.56$; $p < 0.01$) and anxiety ($r = -0.42$; $p < 0.01$). Adolescents with high resistance were more likely to demonstrate: high level of self-regulation, low digital dependence, availability of real social contacts. 6. Neurobiological parameters (in subgroup $n = 87$): Cortisol levels in the morning in adolescents with severe depression were higher than normal (21.3 ± 3.4 ng/ml versus 14.8 ± 2.9 ng/ml; $p < 0.01$). Serum serotonin levels were lower in individuals with PHQ-9 > 15 (102.5 ± 8.7 ng/ml versus 137.4 ± 10.3; $p < 0.01$). Heart rate variability (HRV): the RMSSD index was lowered, the stress index was increased in 61% of the subjects with high anxiety. The EEG pattern showed a decrease in the power

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of the alpha rhythm and an increase in theta activity in the frontal lobes in adolescents with signs of emotional exhaustion. 7. The multiple regression model When constructing a regression model with the level of depression as a dependent variable, it was found that significant predictors are: anxiety level (β = 0.41), digital dependence (β = 0.28), low resistance (β = -0.35), cortisol level (β = 0.22). the model explains 47.3% of the variance (R2 = 0.473; p < 0.001). Conclusions: The data obtained confirm that depressive disorders in young people are formed under the influence of interacting factors. Severe anxiety, low resistance, digital hyperactivity, and biochemical dysregulation of the HPA axis form a single pathogenetic contour. This highlights the need for a multidisciplinary preventive model that includes not only psychological and pedagogical measures, but also biomarker screening.

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