

Training Future Social Workers for Preventive-Corrective Work by Methods of Neuropsychology and Neurocorrection of Deviant Adolescent Behaviour

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Abstract: *The article shows that adolescents are most psychologically vulnerable to multi-vector social influences of today, an abundance of both positive and negative social factors and the declining role of moral values in civil society. Also, it highlights a special role of social workers in the socialization of deviant adolescents. Indeed, it is social workers who ensure cooperation among parents, teachers, law enforcement agencies, social services agencies, psychologists, speech therapists and psychotherapists to prevent juvenile misdemeanours in the framework of value-based education. The areas of socio-psychological assistance provided by social workers to deviant adolescents are prevention and intervention (neurocorrection and coping). To help adolescents cope with deviant behaviour under the guidance of social workers, one must teach them to make choices, assess the consequences of their decisions, regulate emotional processes and organize their lives under generally accepted norms. In the long run, it will become possible to mitigate existing psychological disorders and ensure their socialization. Given the social significance of social work, it is crucial to expand the boundaries of corresponding training by developing interdisciplinary competencies, especially in the field of practical neuropsychology. Finally, the article analyzes the main methods of neuropsychological correction and preventive work with deviant adolescents under the compulsory supervision of social workers.*

Keywords: *Social worker, deviant adolescents, professional training, diagnostics, neuropsychocorrection, preventive measures.*

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Introduction

Socialization is one of the key aspects of one's well-being and the prerequisite for harmonious development. Nowadays, the socio-cultural environment depends on multi-vector social influences, as well as an abundance of both positive and negative social factors to which adolescents are especially vulnerable. The uncontrolled negative impact of the socio-cultural environment, as well as social immaturity, leads to a conscious disregard for the law and various deviations complicating interpersonal interaction (Leshchuk et al., 2018).

Quite often, desocialization and deviant behaviour of adolescents lie in family problems (Apostu, 2016), supported by bad associations. Recognizing the causes of deviance, one can significantly reduce the risks of social maladaptation of both adolescents prone to deviant behaviour and those interacting with them due to competent preventive and neuropsychological work.

Many researchers consider social causes of deviant adolescent behaviour (Babbie, 1992; Shaffer, 2009; Uski & Lampinen, 2014; Gilinskiy, 1997) and analyze psycho-pedagogical factors of deviant behaviour among children and adolescents (Rutter, 1977; Steinberg & Morris, 2001; Swann & Bosson, 2010; Kashchenko, 2020; Lichko, 1985).

Besides, emphasis should be placed on neuro- and differential-psychological approaches that reveal the neuropsychological and individual-psychological factors of deviant behaviour among adolescents (Gut, 2014; Karasievykh et al., 2021; Berbets et al., 2021; Sarancha et al., 2021; Demchenko et al., 2021; Prots et al., 2021; Kosholap et al., 2021).

Neuropsychology proves different roles of the left and right hemispheres in ensuring various forms and parameters of mental activity (the functional asymmetry of the brain). The prefrontal cortex is particularly important to the regulation of activity states. It contributes to generating action plans and programmes, regulating behaviour under environmental requirements and controlling conscious activity (Luria, 2006).

Owing to ambiguous approaches to the functional asymmetry of the brain, it is still important to address this particular problem through understanding human nature and individual options for mental development (Sjöberg et al., 2008; Goldberg, 1992; Kennedy & Adolphs, 2012; Tkach, 2018a).

Further research on the functional asymmetry of the brain by Luria (2006) has revealed an uncertain role of the left and right hemispheres in

enabling sensory, perceptual, emotional and intellectual processes underlying human activity. Those conditions that complicate or enhance actions have also been identified.

According to Luria's concept (2006), the role of the prefrontal cortex in synthesizing the whole system of stimuli and creating an action plan is manifested in current signals, as well as in active behaviour aiming at the near future. Therefore, the problem of deviant adolescent behaviour is still relevant (Siegel, 2014; Homik & Kronik, 1985; Miller & Cummings, 2017; Lichter & Cummings, 2000; Tenenbaum-Casari, 1994). Indeed, adolescence is characterized by certain tension of mechanisms associated with intense neurohumoral changes and specific psychological content.

Many negative trends should be taken into account when studying patterns of deviant behaviour, as well as methods and forms of preventive work with deviant adolescents. These trends are as follows: an increasing number of social pathologies; the criminalization of civil society; a sharp weakening of normative-moral regulation of social relations. It is social workers who can cope with these problems due to their ability to integrate the efforts of all institutions of personal education and provide assistance to all groups of the population in overcoming social and psychological difficulties.

Concerning research on social work training, there are the following four areas of the professional activity theory and the professional development concept: differential-diagnostic (Parsons, 1909), psychoanalytic (Roe, 1956), decision theory, development theory (Holland, 1975).

Psychology considers professional development in two contexts, namely, personal and professional. Personal development implies progressive changes in personality aimed at boosting professional motivation and developing competences (Zeer, 2003; Guziy, 2007). Professional development lies in overcoming contradictions between socio-professional requirements and one's capabilities by stages (Leshchuk, 2009; Vinnikova, 2003).

Theoretical principles of preventing deviant behaviour in young people have been justified by Hawkins & Lishner (1987), Oetting (1992), Vist (2016), Mallaev & Dibirrov (2016), Bogdanovich & Delibalt (2020).

However, it is essential to address the issues revealing the need to expand the scope of social workers' professional activities by developing their interdisciplinary competencies, especially in the field of practical neuropsychology.

Thus, **the article aims to** a) specify the essence and role of neuropsychological education in professional training of social workers dealing with deviant adolescents and the ways of their practical use by selecting, classifying and applying methods of neuropsychological correction and prevention of deviant behaviour; b) prove the effectiveness of tools for preventing deviant adolescent behaviour which adhere to research domain criteria (RDoC).

Generalizing causes and consequences of deviant adolescent behaviour

Adolescents participate in many different socio-cultural situations. In turn, adolescent behaviour can be adequate for each of these situations only when adolescents are well aware of relevant social norms. A personal system of norms develops through grasping social norms and values, entering the social environment, acquiring social experience or trying on certain roles and functions. The main institutions of socialization include families, educational institutions and reference groups. Social norms form under the influence of such an institutional environment. Furthermore, if at least one of these institutions facilitates destructive influence on adolescents, and others do not contribute to its correction, their behaviour will eventually become deviant (Tyurina, 2015).

Deviant behaviour usually manifests itself in adolescence, i.e., the transition from childhood to adulthood, which permeates all aspects of adolescent development. Besides, adolescents are known to be one of the most vulnerable groups. Despite an abundance of scientific concepts and theories of deviation, it is crucial to identify the causes of deviant behaviour and prevent it right away, otherwise this particular problem will only worsen.

There is primary and secondary deviation. Primary deviation is non-normative behaviour, one's desire for self-fulfilment embodied within "normative" behaviour with its various causes. Secondary deviation confirms (freely or involuntarily) the label by which society has marked the previous behaviour (Akhmetzyanova, 2016).

There are many studies on deviant adolescent behaviour, its classifications and definitions. The most common deviations are as follows: alcohol use, smoking (including e-cigarettes), substance abuse, hooliganism, vandalism, sexual violence, pornography addiction, self-harm. The most dangerous deviation is aggression, whereas the least alarming one is a disregard for generally accepted norms (Krupa, 2013). However, this list of

deviant behaviour is increasingly supplemented by new phenomena observed and diagnosed in adolescents (e.g., improper use of risky diets; unlimited access to the Internet, computers, smartphones).

It follows that deviant adolescent behaviour involves anti-social, delinquent, illegal, aggressive, self-destructive and suicidal acts. In all these cases, a deviation is the result of complete or partial failure of socialization, i.e., one's inability or unwillingness to adapt to society and its norms (Hanimoğlu, 2018).

The areas of socio-psychological assistance to deviant adolescents are prevention and intervention (neurocorrection and coping). To help adolescents cope with deviant behaviour under the guidance of social workers, one must teach them to make choices, assess the consequences of their decisions, regulate emotional processes and organize their lives under generally accepted norms. In the long run, it will become possible to mitigate existing psychological disorders and ensure adolescents' socialization.

Thus, it is important to identify the causes of deviance and carry out competent preventive and neuropsychological work to reduce the risks of social maladaptation of both adolescents prone to deviant behaviour and those interacting with them.

Professional training of future social workers and development of their psychological competence

Being a rather complex process, social work requires a profound knowledge of psychology, sociology, pedagogy, healthcare and law.

Owing to socio-cultural changes in society, standards of social work training have come a long way before reaching their current stage of development. Interestingly, this trend is common in all countries. Also, one can observe how professional responsibilities of social workers exceed the generally accepted understanding of the concept itself and encompass related areas, especially those of psychology. On the one hand, the diversity of the profession involves comprehensive and systematic training and, on the other hand, requires a differentiated approach, which must consider subject-specific areas and current contexts (Facchini & Giraldo, 2012).

Social workers should be able to change, eliminate and correct negative socio-psychological manifestations of society. Thus, the essence of social work lies in providing social assistance, closely intertwined with psychological help and specified through certain functions (adaptation, support, preservation and recreation of social values, regulation).

At the same time, the core of social workers' professionalism is their psychological competence, developed in higher education institutions (HEIs) (Derkach, 2004). Psychological competence of future social workers is a complex mechanism that consists of socio-social and psychosocial components (see Fig. 1).

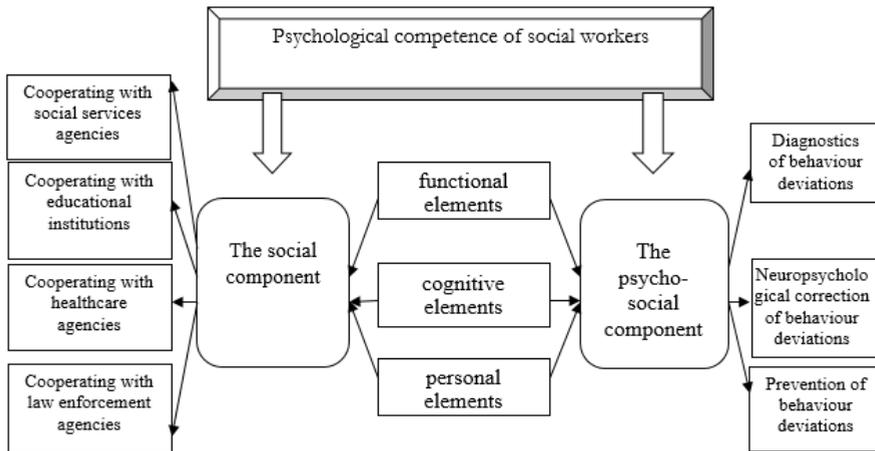


Fig. 1. *Developing psychological competence in future social workers*

* Modelled by the authors based on the findings by Zakharchenko (2009)

The social component of psychological competence serves as the basis for building effective cooperation between social workers and various actors when solving current social problems.

The psycho-social component contributes to effective assistance to clients, mainly adolescents, in overcoming psychological crises caused by negative life circumstances. On the one hand, the diversity of social work implies a comprehensive and systematic use of these two components. On the other hand, it requires a differentiated approach, taking into account specializations and current contexts of the concept itself.

Both components consist of functional, cognitive and personal elements. Therefore, it is essential that university training should provide future social workers with the necessary knowledge of psychology and neuropsychology as its advanced field (Zakharchenko, 2009).

In this regard, innovative standards of social work training in the world's top universities provide for a minimum of psychological knowledge within educational courses, including practical psychology,

psychodiagnostics, social psychology, conflict resolution studies, methods of neurobiology and neuropsychological correction. Owing to these courses, future social workers know socio-psychological characteristics of different categories of clients, tools of effective communication with them, specifics of diagnostics, prevention and neurocorrection of self-destructive borderline personality disorders (Malmberg-Heimonen et al., 2016).

In different countries, social work training has its specific features. At the same time, the common trend is the autonomy of HEIs in planning, duration, structure and tools of the educational process, the list and content of educational courses, assessment. All these factors contribute to training competitive and in-demand specialists.

Concerning social work degrees, admission campaigns differ by country, too. In the UK and Australia, they require applicants to take entrance exams to determine the general level of their training. Most importantly, applicants need to meet the professional selection criteria. In France, candidates must demonstrate psychological motivation in their choice of social work as a future profession. In some countries, practical experience in the social sphere is seen as a prerequisite for successful admission (Korneshchuk, 2017).

In Canada, theory and practice of social work are integrated through a) the cooperation between professional schools and social agencies, b) forms of the educational process organization (theoretical and practical classes in agencies during the week of the study), c) optional theoretical courses in relevant areas of social work, d) practical training in social agencies, e) corresponding training of practice supervisors (full-time employees of social institutions) in colleges, faculties, schools or departments of social work that are part of universities (Vydyshko, 2010). In the USA, the priority is extended field training in social institutions providing social assistance or in private charities. In general, social work training is characterized by the prevalence of individual forms of learning over group work. Concerning bachelor's and master's degrees, the most common are group and micro-group work. Research degrees mostly rely on individual work (see Table 1).

Tab. 1. *Forms and methods of social work training*

Forms		Methods	Non-formal learning methods following the lifelong learning principle (supervision and mentoring)
Group training	Offline	debate lectures, occasional lectures, taking notes	
		practical classes, hands-on training	
		seminars, introductory and integrative seminars	
		consultations	
		interviews, press conferences, talks, dialogues, discussions, debates	
		business and role-playing games, workshops	
		project-based learning	
		methods of problem-based learning	
		teamwork, group work	
		Online	
practical classes with software application			
audio and video presentations			
video conferences			
film viewing			
Individual training	Offline	individual work	
		individual consultations, individual consultations on personal problems	
		diagnostics, monitoring	
		individual tutorials	
		casework in social, medical, penitentiary agencies	
		researching individual situations	
		experimental tasks, modelling	
		creating presentations, reports, posters, portfolios	
		meditations	
		Online	online lectures
	online seminars, individual assignments		
	summative assessment with software application		
	working with electronic libraries		
	working with web-sites		
	working with video materials		

* Developed by the authors based on the findings by Vinnikova (2003), Olkhovych (2008), Sobchak (2004)

Today, curricula much rely on practical implications, innovative technologies, flexibility, compulsory and optional components, modular learning, theory and practice integration, student-centrism, simulation techniques, cooperation between educational and social institutions (Leshchuk, 2009).

Thus, the concept of social work training, including its neuropsychological component, is rather similar in different countries. This proves the feasibility and effectiveness of the above-mentioned methods, tools and forms of training. Also, it will make it possible to optimize the system of social work training at different levels and improve the social situation in any country. Given the complex nature of behavioural disorders among adolescents (as the largest target audience), social workers must possess relevant socio-psychological knowledge and skillfully use different methods of neurocorrection.

Neurocorrection of deviant adolescent behaviour

Social workers are the key figures in all projects on neuropsychological care to adolescents with deviant behaviour. Their priority tasks are as follows: to form trusting relationships with adolescents; study their concerns and personalities; prepare an action plan; establish and coordinate contacts with employees of various institutions and services agencies. Social workers who have received appropriate training in neuropsychology can cope with neuro-psycho-corrective work. Besides, they are able to work with a small number of deviant adolescents as a target group. Importantly, adolescents with behavioural problems should be able to contact a social worker at any time.

According to Allport (1975), this area of socio-corrective assistance is seen as a separate field of social work, focused on successful adaptation of deviant adolescents due to neuropsychocorrection methods, coordination of activities of families and communities and correction of their behavioural functions.

The neuropsychological approach to studying deviant adolescent behaviour, as well as the specifics of social work training in the context of preventive-corrective work, plays a significant role. Therefore, emphasis should be placed on the development and implementation of models, principles, forms and methods of neuropsychological correction.

According to neuro-psycho-correction, deviant adolescent behaviour is a set of behavioural disorders that are not a homogeneous group, neither

in aetiology nor in symptoms. What they have in common is that they are unacceptable in society. Thus, it is important to highlight the specifics of neuropsychological correction, namely, its main forms (addictive behaviour, aggressive behaviour, sexual deviations, suicidal behaviour) (Sarris et al., 2014; Tkach, 2018a).

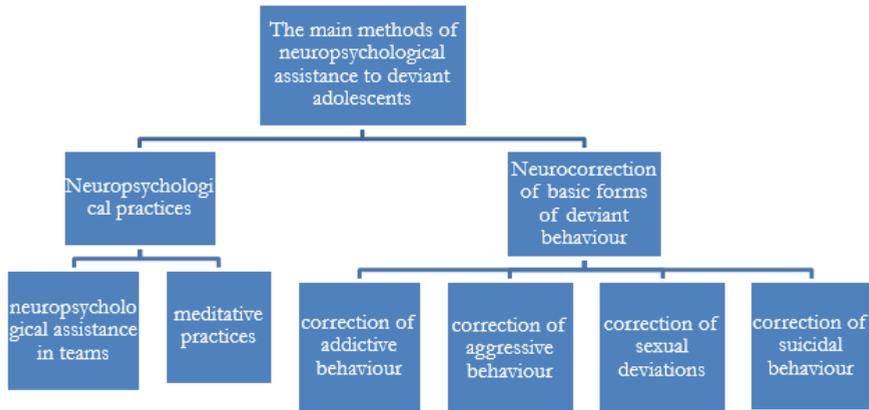


Fig. 2. *Methods of neuropsychological assistance as part of preventive-corrective work*
*Developed by the authors

The authors of this article believe that the main methods of neuropsychological assistance to deviant adolescents and neuropsychological correction of their behaviour are the following: neuropsychological assistance in teams; meditative practices; neuropsychological correction of basic forms of deviant behaviour (correction of addictive behaviour, aggressive behaviour, sexual deviations, suicidal behaviour) (see Fig. 2).

I. Neuropsychological assistance in teams.

Such teams include a neuropsychologist, a school psychologist, a family psychologist, an educator (teacher), a social worker, parents, a rehabilitation specialist, a neurologist or psychiatrist (see Table 2).

A team-based model of complex psychological assistance, which is characterized by flexibility and full adaptation of personality correction, is considered to be the most effective one in neuroscience today (Tkach, 2018a, pp. 234-248).

Tab. 2. *The structure and functions of team-based neuropsychological assistance*

Team members	Responsibilities
Neuropsychologist	Monitoring the child's condition and dynamics of the pathology; adjusting the programme of individual education and development; maintaining contact with other team members; organizing consultations within the team.
Parents	Correcting one's behaviour (given that the child imitates parents' behaviour), nurturing certain qualities (calmness, emotional balance, attention, sense of humour, handling of punishments and rewards, self-criticism, self-confidence, neutral reaction to negative events, positive reaction to neutral and positive events).
School psychologist	Assisting the child in integrating into the school community; preventing negative peer influence and stigmatization.
Educator (teacher)	Compensating at the expense of a loyal attitude towards deviant behaviour. Teachers can change activities every ten minutes and, thus, transfer them from one higher mental function to another.
Social worker	Supervising by taking on the role of frontal lobes of the child's brain. This is an interpsychic stage of forming arbitrary activity (external regulation).
Neurologist or psychiatrist	Providing neurological assistance. In the USA, they prescribe cognitive enhancers or amphetamines to improve attention and neuroleptics for overt negativism, antagonism, and rebellion.

*Developed by the authors

II. Meditative practices.

In the field of deviant behaviour correction, integrative care implies an individual approach. The latter changes the way of life by combining somatic, psychosocial and spiritual points of view with scientifically sound knowledge of traditional neuropsychology and alternative medicine. Over the past decade, research into the effects of meditation on mental health has aroused growing interest in this type of alternative medicine. Meditative practices cover all areas of classical yoga. Furthermore, they consider ethical and spiritual aspects of adolescents' everyday life and motivate them towards sustainable lifestyle modification. Meditative practices can be used in the

clinical context of neuropsychological practices (Ospina et al., 2007; Goyal et al., 2014).

In addition to a holistic, non-invasive and potentially preventive nature, they adhere to all basic principles of naturopathic medicine. In particular, meditative practices help deviant adolescents understand physical and mental processes associated with their well-being in an accessible but effective way (Bringmann et al., 2021). Owing to yoga, relaxation and meditation exercises, deviant adolescents can change these processes intentionally and learn to trust the body's natural abilities.

As noted by Varambally & Gangadhar (2016), yoga should be practised in its entirety, including its ethical aspects. De Manincor et al. (2015) suggest cultivating positive values, attitudes and behaviours to correct adolescent deviance.

In the long run, meditative practices enable deviant adolescents to overcome their antisocial behaviours, as well as restore mental health and disregard neuropsychological dysfunctions and symptoms.

III. Correction of addictive behaviour.

Behaviour neuropsychocorrection is one of the most effective and adequate forms of psychological influence on deviant adolescents. Compared to other approaches to correction, the behavioural approach has several advantages. Due to its conceptual clarity and relative simplicity of methods, this practical approach is directly aimed at changing behaviour. Neuropsychological methods applied to the most common forms of deviant adolescent behaviour are described below.

Addictive behaviour correction is the most common among adolescents. Addictive behaviour manifests itself in a departure from reality in the form of changes in a mental state. Adolescents avoid a reality that does not suit them. All types of addictive activity lead to a break with the former social circle, the world of real people and feelings. Addictive behaviour also takes place when the involvement in an activity, relationship with another person, or addiction to a particular chemical becomes unhealthy. Different manifestations, such as a compulsive, uncontrolled and unconscious desire to repeat the chosen behaviour, social maladaptation and self-destruction (mental and biological), also prove the unhealthiness of these ways of relieving psychological discomfort.

According to Korolenko et al. (2011), all addictions can be divided into two major groups: chemical and non-chemical. Besides, there is an

intermediate group that combines the properties of the first and second ones:

1. Non-chemical addictions: gambling, Internet addiction, love addiction, sexual addiction, relationship addiction (interdependence), work addiction, shopping (compulsive spending).
2. Chemical addictions: alcoholism, drug addiction.
3. An intermediate group: overeating, starvation.

Preventive and corrective measures can be divided into primary, secondary and tertiary, depending on the time of intervention. Primary prevention of addictive behaviour among adolescents involves preventing their involvement in all kinds of addictions. It is suitable for adolescents who are completely unfamiliar or insufficiently aware of the effects of psychoactive substances. This type of prevention includes informing about the consequences of addictions, involving adolescents in different activities, promoting sports sections, art schools, tourism and informing parents and schools about the early signs of adolescent addiction.

Secondary prevention is aimed at identifying adolescents who have already started using psychoactive substances and helping them to prevent physical dependence.

Tertiary prevention encompasses rehabilitation of adolescents with addictions, their return to active life, as well as prevention of relapses (Tkach, 2012).

A system of preventive and neurocorrective measures lies in creating alternative motivation in adolescents concerning the existing negative needs and leading them to a considered choice. It is the elements of positive motivation that become the foundation on which one can build the programme of assistance and support for adolescents with addictive behaviour. This programme allows them to experience normal human relationships in all life situations, stimulates new self-concepts and self-identifications. Besides, it helps them feel attached to others, eliminates isolation, chronic stress and expands time perspectives.

At the same time, there is neurocorrection of one's attitude towards the future through career guidance under the supervision of social workers by fixating and elaborating personal changes in social relations, determining short- and long-term prospects, recognizing different axiological systems.

IV. Correction of aggressive behaviour.

A detailed review of studies on neuropsychocorrection of aggressive behaviour among adolescents shows that a neuropsychological classification

of adolescent aggression and methods of overcoming it is the most detailed and constructive one (Foster et al., 1993; Goldberg, 2001; Tkach, 2018a). According to it, aggression is seen as primary, secondary and tertiary components of the symptom complex (see Table 3).

Aggressive behaviour as a primary defect of the prefrontal cortex (personality disorder of organic origin) is the result of violations in the programming, regulation and control of mental activity (Foster et al., 1993; Goldberg, 2001). As a secondary defect, aggression manifests itself in hostile attribution bias (considering situations and events as hostile). The situation is critical concerning adolescents, given that disorders in the lower structures cause those of the higher ones. Aggression as the tertiary symptom complex can be overcome by reducing the activity of the pleasure centre and establishing connections between the prefrontal cortex and the adjacent nucleus (Tkach, 2018a).

Tab. 3. *The classification of adolescent aggression, depending on the symptom complex*

No	Brain dysfunction type	Disorder type	Neurocorrection
Adolescent aggression as a primary defect of prefrontal cortex damage			
	Dysfunction of the orbitofrontal cortex	Antisocial personality disorder; attention deficit hyperactivity disorder	<ul style="list-style-type: none"> - training attention and developing time management skills with the help of yoga, oriental martial arts, tennis, throwing objects; - training attention stability by doing puzzles; - cultivating self-restraint (by counting to 10 before acting); - meditations (attention concentration).
	Dysfunction of the ventromedial prefrontal cortex	Narcissistic personality disorder	<ul style="list-style-type: none"> - compassion meditation; - activities with people's faces in photos (comics) / movies (cartoons); - working with the images of emotional states; - role-playing games on frustrating situations; trying on the roles of an aggressor and a victim; - writing essays about emotions; drawing and sculpting emotional faces, correcting inflated self-esteem.

	Dysfunction of the dorsolateral prefrontal cortex	Hypobulia; fanaticism; attention deficit syndrome	<ul style="list-style-type: none"> - exercises aimed at strengthening the positive self-concept: “the success map” (a pie chart with different areas of personality); - clubs; - awareness meditations.
	Dysfunction of the lateral prefrontal cortex	motor behaviour control violation; physical aggression	<ul style="list-style-type: none"> - controlled motor activity (doing yoga; creating “a conscious map of the body”, presented in the neocortex); - transforming destructive actions into the verbal plane (the “stop and think before doing” rule)
	Dysfunction of the anterior cingulate cortex	Acquired psychopathology personality	<ul style="list-style-type: none"> - realizing the causes of one’s anger - expanding the range of behavioural reactions; - cultivating empathy and emotional expression (presence meditation (contemplating intrapsychic activity, breathing, heartbeat), compassion meditation); - facial expressions in front of a mirror; - analyzing others’ emotions; - overcoming emotional “block” (inertia) on a problematic situation.
	Tonsillar lesion - bilateral lesions of the temporal lobe	Ataraxia; Klüver-Bucy syndrome	<ul style="list-style-type: none"> - treating the cause (neuroinfections, parasites, injuries, metabolic disorders) that has led to the lesion; - being critical to arbitrary actions and one’s fearlessness.
Adolescent aggression as a secondary defect of prefrontal cortex damage			
	Normal or slightly elevated hippocampal function	Hostile attribution bias	<ul style="list-style-type: none"> - compassion meditation; - developing social skills; - being aware of social roles and their behavioural models; - Hellinger therapy.
	Reduced hippocampal function	Hostile attribution bias	<ul style="list-style-type: none"> - reducing excessive sensitivity to negative attitudes; - applying emotional desensitization when perceiving situations or others as hostile to oneself; - controlling emotions (relaxation techniques: muscle relaxation, deep

			breathing, visual images); - role-playing games, Hellinger therapy.
Aggression as the tertiary symptom complex			
	A break in the connection between the prefrontal cortex and the adjacent nucleus	Reduced activity of the pleasure centre of the brain	- cultivating a culture of thinking and relying on critical inner voice; - complex meditation (object-free, awareness, concentration compassion).

* Developed by the authors based on the findings by Tkach (2018a)

V. Correction of sexual deviations.

Adolescence is an awakening of sexuality and sexual desire, characterized by insufficient differentiation, increased excitability (hypersexuality), as well as incomplete sexual identification in the neuropsychological sense (Kon, 1979). Consequently, sexual deviations may occur under the influence of situational factors. Different types of mental illnesses and accentuations share some features of sexual deviations. Both mature and immature adolescents are most at risk. Mature adolescents experience sexual desire long before social maturity. Owing to the supercompensation reaction, immature adolescents occasionally feel an urge to “keep up with” and even “outrun” peers sexually. In other cases, they might fall victim to molestation by more mature adolescents because of their infantilism and inability to resist them (Schore, 1994).

Even though pubertal onset is part of natural adolescent behaviour and development, it may also be associated with negative trends if sexual behaviour involves sexual activity at an early age or without proper attention to risks (Maswikwa et al., 2015).

Given that there is no universal definition of early pubertal onset, it is often classified as sexual intercourse at school age (Johnson & Tyler, 2007).

Many adolescents engage in sexual activity earlier than allowed by law (Klettke & Mellor, 2012; Yarrow et al., 2014). In the USA, 62% of high school students become sexually active before graduation (Abma et al., 2011).

As adolescents grow older and engage in normal sexual life, deviations mostly disappear completely. Under adverse conditions, it may become necessary to use individual methods of neurocorrection (Dorius et al., 1993).

Human sexuality is an extremely delicate area that requires extensive knowledge of philosophy, culturology, social psychology, neuropsychology, psychiatry, endocrinology, urology, gynaecology and andrology. Education and world outlook, as well as culture and legislation of society, determine the tactic of neuropsychological correction of sexual deviations (Tkach, 2018a).

In general, there are five approaches to treating sexual deviations in adolescents: behavioural procedures designed to eliminate deviant sexual behaviour; behavioural procedures aimed at promoting non-deviant sexual behaviour; thought-stopping techniques; mindfulness-based cognitive therapy and pharmacological methods (Pringle et al., 2017).

1. Behavioural procedures, designed to eliminate deviant sexual behaviour.

- Latent sensitization (Cautela, 1967) is the most popular behavioural procedure in the world. It involves reducing deviant sexual arousal in adolescents. In particular, clients must combine their deviant sexual thoughts with the images of negative consequences of sexual crimes (Hunter et al., 2011).

- Unpleasant-smelling (Colson, 1972). Clients are encouraged to inhale an unpleasant odour that rejects sexual desire or thoughts. This method has helped approximately 10% of adolescent boys and 6% of adolescent girls who participated in the US Neurocorrection Program (McGrath et al., 2010).

- Aversion therapy (Wickramasekera, 1976), also known as therapy for shame (Serber, 1970; McGrath et al., 2010), is used in 15% of adolescent sexual deviations treatment programmes in the USA. According to this approach, clients combine strong shame and/or anxiety with their deviant sexual thoughts and/or recreation of past sexual crimes. At the same time, shame is known to inhibit the treatment of adolescents who have committed deviant sexual acts (Proeve & Howells, 2002; Ward et al., 2004).

Unfortunately, there is very little research on the use of behavioural techniques to reduce deviant sexual behaviour in adolescents (McGrath et al., 2010). Besides, there are numerous ethical issues with the use of behavioural procedures aimed at reducing deviant sexual arousal in adolescents.

2. Behavioural procedures aimed at promoting non-deviant sexual behaviour.

- thematic shifts, i.e., focusing one's erotic fantasies on non-deviant topics (Fisher & McGregor, 1997);

- systematic desensitization (Maletzky & McGovern, 1991).

3. Thought-stopping techniques.

These techniques aim to teach adolescents to stop deviant thoughts and impulses (Hunter et al., 2011; Richardson et al., 2001). However, available research shows that simple deprivation procedures should often lead to just the opposite. Johnston et al. (1997) suggest helping adolescents to understand why their deviant sexual thoughts are problematic, rather than teaching them not to do so.

Cognitive adjustment is indeed common in the treatment of adolescents who have committed sexual deviant acts (Hackett et al., 2006; McGrath et al., 2010). Yet, there are only a few scientific descriptions of how this goal can be achieved.

4. Mindfulness-based cognitive therapy.

According to this approach, one learns to notice one's deviant thoughts and, without judging or stopping them, monitor the feelings and reactions of the body (Worling, 2012). In doing so, adolescents deliberately reject deviant sexual behaviour, not suppressing it. Even though some researchers describe it as a new approach to treating deviant sexual disorders, it has, in fact, long been part of neurocorrection programmes for adolescents with deviant sexual behaviour (Steen & Monnette, 1989).

Few studies on the use of neurocorrective techniques show that mindfulness-based cognitive therapy is more effective than thought-stopping techniques (Biegel et al., 2009).

5. Pharmacological interventions constitute another approach to reducing deviant sexual arousal.

Currently, there is a very little empirical basis to support the use of medications by adolescents who have committed sexual deviant acts (Bradford & Federoff, 2006; Shaw, 1999). Bradford & Federoff (2006) claim that there is a high possibility of unwanted side effects from taking medications used to control sexual behaviour. Besides, government authorities in most countries do not approve such treatment.

VI. Correction of suicidal behaviour.

Suicidal behaviour is an extremely specific deviation that requires advanced actions from a psychologist. It is a consequence of one's socio-

psychological maladaptation in the internal micro-social conflict one is experiencing. The inability to promptly recognize and stop the suicidal process hinders the effectiveness of therapy, in this case, suicide prevention (White et al., 2017).

According to the WHO (2013), suicide rates have risen by 60% worldwide in the last 45 years. In some countries, suicide is the second leading cause of death among those aged between 10 and 24. These figures do not take into account suicide attempts, which occur 20 times more often than completed suicides. Adolescent and youth suicide rates are the highest in New Zealand, Finland, Ireland and Eastern Europe (WHO, 2013).

The causes of adolescent suicide are closely related to the problems in the immediate environment: the divorce of parents, their remarriage, alcoholism, conflicts, illnesses and loss of close relatives. In such situations, the sphere of children's communication changes and leads to a complex internal conflict: the need to communicate remains and, yet, it is no longer possible to fulfil it in the usual forms. Not knowing how to influence family members or others, the child thinks about suicide.

Suicidal behaviour among adolescents, without any psychiatric pathology, occurs when traumatic factors are stronger than protective mechanisms. The neuropsychological basis of suicidal behaviour includes the following: dysfunction of the ventral prefrontal cortex, hyperfunction of the dorsolateral prefrontal cortex, hypofunction of the orbitofrontal cortex; hyperactivity of the neocortex of the right hemisphere. Suicidal thoughts are preceded by a change in the activity of the vagus nerve, namely, the visceral component of suicide (discomfort in the body).

The system of corresponding preventive measures much relies on psychotherapeutic effects. In many cases, they are the only effective way to help patients who are at risk of suicide.

Suicidal behaviour correction is a set of neuropsychotherapeutic techniques and methods aimed at helping adolescents in a state of socio-psychological maladaptation due to severe stress and preventing suicide attempts.

The tactic of suicidal behaviour neurocorrection involves the following: studying the importance of stressors for adolescents; providing the necessary social and microsocial support; showing empathy; encouraging the search for alternative ways to solve the problem. Quite effective are relaxation and hypnosis if anxiety predominates. It may also seem necessary to use suggestion, persuasion, environmental change, hospitalization.

The main goal of suicidal behaviour neurocorrection is to use the plasticity of the connotative sphere of a suicidal person, i.e., his or her willingness to abandon the old system of meanings and values and develop new ones. Accordingly, the strategy of crisis therapy lies in creating psychological conditions for the personal growth of an adolescent with this form of deviant behaviour (Starshenbaum, 2005).

The role of social workers in the prevention of deviant adolescent behaviour

The system of adolescent deviation prevention should involve purposeful, planned, interconnected and controllable activities of all its actors, namely, parents and social workers. It aims to preclude maladaptation and create conditions for the successful socialization of all adolescents. Preventive work can be primary or secondary. Primary prevention promotes a healthy lifestyle and inhibits antisocial phenomena. Secondary prevention involves working with adolescents with special educational needs: adolescents with deviant symptoms; adolescents with progressive social degradation. Given that adolescents from the first group are prone to aggressive behaviour, they should be included in the control group of secondary prevention after correctional work. Adolescents from the second group use alcohol and drugs systematically. Therefore, they will be included in the control group only after treatment and recovery or sustained remission.

Social workers strive to create socio-psychological conditions for positive interaction between the environment and the child. The main methods of prevention are information support, individual counselling, group classes aimed at learning the rules of social behaviour, joint activities of interest to adolescents, parents, teachers and other representatives of the social environment of deviants. It is important to use integrative measures (Afanasyeva et al., 2014; Zmanovskaya & Rybnikov, 2012).

The main principles of corrective work with deviant adolescents include comprehensiveness (the interaction with adolescents, family, school, the immediate environment); systematicity (the correction of personal, behavioural qualities and communication skills); practical focus; active participation of adolescents in correction; continuity concerning clients (post-correctional observation of adolescents, their transfer to the group of secondary prevention) and specialists.

Volnova (2016) highlights several approaches to choosing preventive technologies when working with persistent adolescent deviations:

1. *An informative approach.* It is associated with adolescent ignorance, which results in behavioural deviations. In this regard, the main goal is to inform adolescents about their rights and responsibilities, social norms and standards of behaviour, as well as legal consequences of deviant behaviour.

2. *A social preventive approach.* It lies in identifying, eliminating and neutralizing the causes and conditions that lead to deviations. This approach involves teaching adolescents the rules and norms of hygiene (taking into account gender and age) and studying the peculiarities of adolescent physical and mental development.

3. *A socio-pedagogical approach.* It is aimed at restoring or correcting deviant behaviour. Consequently, preventive work with adolescents includes educational, psychological and social components.

4. *A medical neuropsychological approach.* It precludes possible deviations from social norms by targeted treatment of various mental illnesses.

Interestingly, those measures that rely on the participation and close interaction between social workers and neuropsychologists within the framework of psychologization of learning and preventive activities prove to be the most effective ones.

According to Goldberg (1992) and Schore (1994), deviant adolescent behaviour is largely a socio-psychological problem. At the same time, psychiatric taxonomies, including the International Classification of Diseases, Tenth Revision (ICD-10), do not recognize deviant behaviour as a diagnostic category. Even persistent stereotypes of deviant behaviour may not be construed as a sign of mental pathology (Kuvshynov et al., 2017). Nevertheless, methods of clinical psychiatry are not intended for expert interpretation of deviant behaviour forms and diagnostics of predisposition to it. As a result, one in three adolescents suffers from at least an addictive form of deviant behaviour (Demkin, 2020). Other, rarer forms of deviant behaviour that are most common among adolescents include aggressive and suicidal types of deviant behaviour, as well as sexual deviations.

Available tools used to identify adolescents prone to deviant behaviour are often subjective methods in the form of questionnaires. Their reliability has some limitations since it mostly depends on respondents' willingness to provide truthful information about themselves (Hoff et al., 2009).

A more effective approach to identifying deviant adolescent behaviour and preventing it adheres to research domain criteria (RDoC). These criteria create a theoretical basis for deciphering the interaction between deviant behaviour domains and neurophysiological systems underlying them (National Research Council, 2014). Thus, this approach allows one to evaluate objective data of neurofunctional and neuromorphological diagnostics (based on electroencephalographic studies), rather than subjective information from the adolescent being examined (Hajcak & Patrick, 2015).

A comprehensive neuropsychological and neurophysiological study of deviant adolescent behaviour makes it possible to determine the topography of neurofunctional pathology in the case of social deviance. The symptom complex of deviant behaviour in such people is often caused by minimal dysfunction in the frontal cortex: the orbitofrontal cortex (OFC), the dorsolateral prefrontal cortex (DLPFC), the anterior cingulate cortex (ACC) and the ventromedial prefrontal cortex (vmPFC) (Tkach, 2018b). In this case, each localization of disorders leads to a certain type of deviations shown in Table 4.

Tab. 4. *The description of deviant behaviour symptom complexes, depending on the predominant topography of disorders*

Topography of disorders	Deviant symptom complex	Observation frequency, %
OFC	Immoral-impulsive	53
DLPFC	Passive-subordinate	28
ACC	Rigid-incompetent	10
vmPFC	Machiavellianism	9

* (Tkach, 2018b; Demkin, 2020).

Thus, the neurophysiological paradigm of diagnostics and prevention of deviant adolescent behaviour relies on the fact that patients prone to deviations have certain morphological and physiological differences in the central nervous system. These differences can be detected by instrumental and experimental methods. Such symptoms of deviant behaviour as fear of failure of prediction error, lack of fear of possible negative consequences and inability to use one's or others' experience are caused by neurophysiological disorders in the brain networks, responsible for the system of negative valence and cognitive control (Sengupta et al, 2016). In a

normal way, fear of possible negative consequences emerges as a function of the prediction error, i.e., the discrepancy between the actual and expected results. In the case of adolescents prone to deviant behaviour, the fear learning function is inhibited: the fear that emerges is short-term and disappears when the danger has already passed without the effect of learning. In turn, this disrupts the inhibition of undesirable behavioural responses in the system of behaviour cognitive control (Demkin, 2020).

It is always crucial to promote discipline and the rule of law and reduce deviant manifestations among adolescents, especially in the school environment. A detailed analysis of relevant neuropsychological studies shows that most forms of deviant behaviour among middle and high school students have a topographically localized neurophysiological basis. It follows that the most advanced methods of assessing and preventing predisposition to deviant adolescent behaviour are neuropsychological and neurophysiological research methods conducted in contact (functional magnetic resonance imaging) and non-contact (oculography, pupillometry) ways. Therefore, early diagnostics and prevention of deviant adolescent behaviour play an essential role, given that they involve the cooperation between social workers and neuropsychologists.

Conclusions

Nowadays, deviant adolescent behaviour is the most common and thorniest problem of personality development of middle and high school students. Despite the external similarity, each form of deviant adolescent behaviour has its specific manifestations and aetiology. Therefore, it is essential to apply a constructive individual approach when selecting methods of diagnostics, neurocorrection and prevention.

The main goal of prevention and neuropsychological correction of deviations among high school students is to overcome deviant manifestations of adolescent behaviour.

The most effective methods of neuropsychological assistance to deviant adolescents and neuropsychological correction of their behaviour are the following: neuropsychological assistance in teams; meditative practices; neuropsychological correction of the main forms of deviant behaviour (correction of addictive behaviour, aggressive behaviour, sexual deviations, suicidal behaviour).

This research has proved that the most advanced and effective tools for preventing adolescent deviations are the methods following research

domain criteria (RDoC). These criteria create a theoretical basis for deciphering the interaction between deviant behaviour domains and neurophysiological systems underlying them.

Social workers are the main and constant participants in neuropsychocorrection and prevention of deviant adolescent behaviour. Indeed, they assist deviant adolescents from the moment of diagnostics until their full rehabilitation. Given an unstable and aggressive (to developing personalities) today's world, social work training should provide future specialists with the relevant knowledge and methods of psychology, especially neuropsychological correction and its effective practices.

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