

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

НАУКОВИЙ ВІСНИК

МУКАЧІВСЬКОГО ДЕРЖАВНОГО
УНІВЕРСИТЕТУ

**СЕРІЯ
«ПЕДАГОГІКА ТА ПСИХОЛОГІЯ»**

Науковий журнал

**ТОМ 8, № 4
2022**

МУКАЧЕВО
2022

ISSN 2413-3329
E-ISSN 2520-6788

**Свідоцтво про державну реєстрацію
друкованого засобу масової інформації**
Серія: КВ № 24709-14649 ПР від 17.02.2021 р.

Свідоцтво суб'єкта видавничої справи
Серія: ДК № 6984 від 20.11.2019 р.

Журнал включено
до Переліку наукових фахових видань України (Категорія «Б»)
з педагогічних наук (наказ МОН України № 1643 від 28 грудня 2019 р.),
психологічних наук (наказ МОН України № 409 від 17 березня 2020 р.)

Журнал представлено
у таких наукометричних базах:
Research Bib (Японія), Index Copernicus (Польща), Cite Factor,
Infobase Index (Індія), Genamics JournalSeek, Academic Keys (США),
ACNP Catalogue (Італія)

Науковий вісник Мукачівського державного університету. Серія «Педагогіка та психологія» / Ред. кол.:
В. Й. Бочелюк та ін. Мукачево : Вид-во МДУ, 2022. Т. 8, № 4. 106 с.

Засновник і видавець:
Мукачівський державний університет
89600, вул. Ужгородська, 26, м. Мукачево
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MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SCIENTIFIC BULLETIN
OF MUKACHEVO STATE UNIVERSITY

**SERIES “PEDAGOGY
AND PSYCHOLOGY”**

Scientific Journal

**VOL. 8, No. 4
2022**

MUKACHEVO
2022

ISSN 2413-3329
E-ISSN 2520-6788

Certificate of state registration of the print media

Series: KV No. 24709-14649 PR dated 17.02.2021

Certificate of the publishing subject

Series: DK No. 6984 dated November 20, 2019

**Journal included in List of Professional Scientific
Publications of Ukraine (Category “B”)**

in pedagogical sciences (order of the Ministry of Education and Science
of Ukraine No. 1643 of December 28, 2019),
psychological sciences (order of the Ministry of Education and Science
of Ukraine No. 409 of March 17, 2020)

The journal is presented in the following scientometric databases:

Research Bib (Japan), Index Copernicus (Poland), Cite Factor,
Infobase Index (India), Genamics JournalSeek, Academic Keys (USA),
ACNP Catalog (Italy)

Scientific Bulletin of Mukachevo State University. Series “Pedagogy and Psychology” / Editorial Board:
V. Bocheliuk et al. Mukachevo : MSU Publishing House, 2022. Vol. 8, No. 4. 106 p.

Founder and Publisher:

Mukachevo State University
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Transcarpathian region, Ukraine
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UDC 159.92

DOI: 10.52534/msu-pp.8(4).2022.9-17

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Formation of Stereotypes of Human Behaviour under the Influence of Childhood Fears

Article's History:

Received: 05.09.2022

Revised: 02.12.2022

Accepted: 28.12.2022

Suggested Citation:

Shcherban, T.D., Bretsko, I.I., & Varha, V.S. (2022). Typology of social skills and their impairments in children with autism spectrum disorders. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 9-17.

Abstract. The relevance of the study is due to the presence of a relationship that occurs between the emotional and intellectual development of the individual. Negative changes in the process of emotional development of a person lead to the fact that they are unable to use other structures, in particular, intelligence, and therefore develop harmoniously. As a basic emotion, fear is an integral part of the emotional field, as is the emotion of joy, sadness, and anger. Fear performs a protective function, but it also destroys the individual if it is irrational. The emotion of fear, arising in childhood, can be fixed and transformed into more acute manifestations, that is, into phobic disorders. Personality is formed under the influence of society, so a very important role in its development is played by models of upbringing in the family and those attitudes and prescriptions that a person learns from childhood. In adulthood, these patterns are manifested in the form of stereotypical behaviour, which substantially affects a person's quality of life. Therefore, it is important to clarify how childhood fears can affect the individual in adulthood. The purpose of this study is to establish a link between childhood fears and stereotypical behaviour. A number of methods and techniques were used to achieve this goal, including theoretical (analysis, synthesis, generalisation) and practical (D. McLain's general tolerance for uncertainty scale; tolerance-intolerance of ambiguity questionnaire by T.V. Kornilova; questionnaire of childhood fears). The results of the study show that in the case when a person cannot safely live through fears as a child, they have an impact on the psychological well-being of the individual, which encourages the formation of psychological problems. It is proved that as a result of gender stereotypes in education, male and female fears formed in childhood differ markedly. Therewith, it is noted that certain stereotypes have a positive meaning in a person's life if they do not suppress their psychological development. The research materials will be useful for practical psychologists in the education and social fields, and teachers

Keywords: emotional field, behaviour patterns, behaviour, emotions, personality, fears

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INTRODUCTION

The relevance of the study of the emotional field in general and the subject of fears have always been under the precise attention of researchers because emotions play a substantial role in human life. Fears can reduce a person's quality of life, limit their activities, social interaction with others, and generally negatively affect the socialisation process, which begins in preschool age. Fears that arise and are not resolved in childhood are transformed into fears in adulthood and lead to destructive changes in the interaction of the individual with peers or cause a distorted perception of reality. Researcher I. Babarykina connects the

appearance of fears with the specific features of the child's emotional experience [1]. In her opinion, children with stereotypical emotional experiences are dominated by fear of knowledge-testing situations. This observation gives the opportunity to notice the relationship between the presence of fears and the formation of certain stereotypical behaviour in a particular situation in the future. Since the nature of the emotional content of the stereotype is currently poorly understood, the study of fears from the standpoint of the formation of stereotyping is important and relevant. The purpose of the study is to investigate the relationship

between childhood fears and the formation and consolidation of stereotypical behaviour in adulthood. The object of research is childhood fears as a key factor in the formation of stereotypical behaviour. Subject – features of the formation of stereotypical human behaviour under the influence of childhood fears. A number of tasks are formulated to achieve the research goal: analyse the theoretical basis for the emergence of childhood fears; determine the features of the formation of stereotypical behaviour; conduct an empirical study to establish the relationship between indicators of stereotyping and childhood fears.

It is worth noting that in the current conditions in which the world is located, it is extremely important for an individual to be able to quickly adapt to sudden changes and solve problems using non-standard approaches. In this context, stereotypes negatively affect a person's consciousness, since they lose the ability to objectively analyse certain phenomena and perceive them in a convenient form [2]. Stereotypes are, in fact, "short paths" taken unconsciously, which help people make decisions easier and faster, hence the tendency to make them unconditionally [3]. According to I. Kulynych, the prerequisite for the formation of stereotypes are the past experience of the individual because their memory is filled with emotional memories of important events for them [4]. As a rule, stereotypes are reflected in folk traditions, religious convictions, and beliefs. Therewith, in the context of the active development of society, stereotypes are increasingly included in social and legal norms, moral prescriptions, methods of education, family traditions and beliefs. The predominance of stereotypical behaviour as the identification of a person's life activity is caused by the fact that stereotyping, unlike other psychological mechanisms, provides a person with the ability to quickly, and most importantly – reliably analyse and change their social environment [5].

The concept of "stereotyping" is associated with the processes of tolerance for uncertainty, because tolerance is defined as the opposite of stereotypical behaviour. Tolerance today is understood as a systemic category that contains the identifications of psychological stability, determination, confidence in the search and vision of alternatives, personal principles, and group values. It is important that these processes are not hindered by anything, in particular, the fears that are assimilated with parenting models in the family. For example, fear of uncertainty is a key threat to problem solving and tolerance formation and therefore is the key to stereotyping during social interaction [2]. Therefore, stereotypes are a simplified model for responding, understanding, evaluating, and reflecting a person's position in relation to certain objects that are reflected at different stages of the implementation of the social system. It is important to adjust the factors that contribute to the stereotyping of personal behaviour in the future

Researchers claim [6] that there is a direct link between parents' fears and the development of the same fears in their children. In addition, women are more likely to

acquire specific phobias than men. Moving away from the concept of biological gender, there are studies that prove that people with female stereotypical characteristics are more likely to be cowardly than people with stereotypical male characteristics. The effect of responses to the same fear of mothers and daughters was investigated. A snake was chosen as the object of fear. It was identified that there is a correlation between the level of fear of mother and daughter when they encounter a living reptile. The children tried to avoid contact with snakes, as they saw the reaction of their mothers when meeting the animal. It can be concluded that there is a potential influence of gender stereotypes of parents, in particular, mothers, on the formation of similar fears in their offspring.

Other researchers [7] consider the heredity of various fears across generations. Fear can arise not only from a specific object, but it can also have a social character. For example, parents' fear of negative judgement affects the inheritance of social anxiety by offspring from generation to generation. The results of a study of the transmission of social anxiety in families of Caucasian peoples indicate that there is a link between social anxiety in mothers and negative upbringing. Obsessive parenting is also one of the consequences of the social anxiety of the father and mother.

The source of acquired fears can also be experiences caused by unpredictable events. The global COVID-19 pandemic has left a noticeable mark on the psyche of both adults and children. The researchers identified [8] that the more fear parents felt about the coronavirus, the more fear their children acquired about the virus. In addition, receiving negative information from teachers and the consumption of news from mass communication media also increased the degree of fear in children. Maintaining childhood mental health, especially in times of global crises, should be a priority for both parents and educators.

The study of childhood trust in their parents in dangerous and threatening situations [9] is also quite an interesting subject. Fears, whether inherited or acquired, force children to seek help from other, more experienced people. The results of the study show that children aged 4 to 17 years, when demonstrating linear models of mixed effects (fear procedures and neutral emotional training), identified the faces of their parents faster than that of strangers. However, in cases of teaching children about possible fears, the participants in the experiment chose strangers, and therefore potentially threatening, people among the available ones. This indicates a decrease in the level of authority of parents for children in case of their early preparation for a meeting with fear. This is because children have a desire to personally face fear and experience it on their own.

The purpose of the study is to identify the link between fears acquired in childhood and stereotypical behaviour. The scientific originality of the study consists in satisfying the needs of psychologists in the educational and social fields, and teachers in the theoretical basis for implementing an approach to preserving the psychological and mental health of minor children in crisis periods.

MATERIALS AND METHODS

Both theoretical and practical application methods were used in the study. Theoretical research methods include analysis, synthesis, generalisation, comparison, and classification.

The empirical study was conducted on a sample of 130 people aged 21 to 49 years (mean age 32 years), including 71 women and 59 men. The following methods are used to effectively evaluate the relevant parameters. D. McLain's Multiple Stimulus Types Ambiguity Tolerance Scale-I (MSTAT-1) provided an opportunity to analyse the response to the perception of uncertain stimuli of various types. In this method, attention is paid to the establishment of ambiguity as a characteristic feature of insufficient information about a particular situation. The questionnaire contains 22 items that reflect the attitude of the individual to the manifestations of uncertainty, and clear regulation and predictability of life. Survey participants answered the proposed questions using a 7-point Likert scale, in which a score of 1 characterises the option "absolutely disagree", 4 – "something in between", 7 – "absolutely agree". The questionnaire allowed quantitative indicators to determine the respondents' attitude to relevance; sudden changes in society; uncertain events and the overall score of tolerance for uncertainty [2].

$$\text{Stereotyping index} = \frac{\text{IU (intolerance for uncertainty)}}{\text{TU (tolerance for uncertainty)}} \quad (1)$$

The author's questionnaire was developed and implemented to investigate and analyse childhood fears, which features a questionnaire describing 42 fears characteristic of the consciousness of children and adolescents. Their list was compiled preliminarily by an examination of primary sources, during which, interviews on childhood fears were organised and conducted. During the interview, participants named 2-4 fears and described them in detail. Thus, due to preliminary planning and registration of the list of fears, it is possible to cover a broader phenomenological plane and identify fears that were not mentioned during the interview [2].

RESULTS

Since the stereotyping factor is directly related to the processes of tolerance and intolerance, an empirical study is designed to establish the existence of a relationship between these indicators. The study of tolerance for uncertainty was conducted using the MSTAT-I method, compared with standard indicators. The survey averages obtained were lower than those obtained during standardisation. This factor is explained by age characteristics since older people do not react so vividly to uncertain situations when compared with young people. Notably, tolerance for uncertainty has cultural and social characteristics. Contact with uncertainty creates anxious reactions in the mind of a person and, considering the individual characteristics of people (age, characterological, and professional), some are prone to activation, while others, on the contrary, slow down and deepen into depressive states.

The new uncertainty tolerance questionnaire [10] is based on a three-factor model obtained empirically. The method allows thoroughly assessing the three main factors that explain the phenomenon of tolerance. The first factor contains 12 items and is characterised by the readiness and desire of the individual for changes, and transformations that form originality, enabling the development of unique ways to solve complex tasks and functions. In addition, it expresses the ability of the individual to independently go beyond the established limits. The second factor contains 13 items, from intolerance for uncertainty. It describes a person's motivation for order in the context of an attitude to the world and a negative attitude to uncertainty. This factor is characterised by strict compliance with the rules and principles, which in turn provide for a dichotomous division that includes "right and wrong" approaches, actions, and assessments. The third factor consists of 8 points that relate to interpersonal intolerance and uncertainty. It includes a person's desire to control human activity and relationships in the world [10]. This method allowed determining the stereotyping index, which proceeds from the fact that tolerance for uncertainty in the context of an integral human property should be characterised not by quantitative indicators, but by their ratio (Formula 1).

Results of T.V. Kornilova's uncertainty tolerance questionnaire allow for determining the indicator of intolerance as an independent scale associated with the manifestations of various psychological properties. Its essence is uncovered in the specific features of stereotypical trends that spread among people during the perception and interpretation of the environment, including life situations as a source of threat. During the analysis and processing of the results, it was identified that the indicators of tolerance and intolerance of one person can be equally high, low, or substantially different [10]. Therefore, tolerance for uncertainty in the context of an integral human property should be determined not only by the quantitative measures of these characteristics but also by their connection. Thus, a new indicator is derived – the stereotyping index, that is, the ratio of intolerance to tolerance. As for the diagnostic sample, the indicators do not differ substantially in men (1.16 ± 0.176) and women (1.16 ± 0.188).

Since the phenomenology of childhood fears is qualitatively analysed and investigated, special attention is paid to its continuation in the adult life of the individual. The data obtained are not well-known, but they allow for identifying and describing the goals of therapeutic intervention among a large list of psychological problems. The study of fears was conducted through the author's questionnaire in two stages: fears in childhood and fears that remained in adulthood. In the first stage, the responses of respondents with low emotional intensity prevailed. An important conclusion was that the prevalence and severity of childhood

fears are due to gender characteristics. Ultimately, it was female representatives who more often recalled the fears of childhood, which are characterised by a social nature. Among them are fears related to the health and well-being of relatives; fear of dissatisfaction on the part of parents; fear of getting negative marks in an educational institution, or making a mistake. The choice of this type of response was typical for about 60% of the total number of participants. Among men, more than half of the respondents noted that in childhood they had a fear of being left alone, for the health of their relatives, heights, and medical personnel, such as dentists. Important indicators were identified for fears of punishment, dissatisfaction of parents or other adults, which correlate with social anxiety about being late,

making mistakes, public speaking, and ridicule from peers. Indicators for these items range from 51% to 82% of the total sample of participants. Common in the choice by both women and men are fears of small animals, and darkness or nightmares, which usually correlate with fear of an imaginary monster [2].

Regarding the second stage of the survey, regarding fears that remain in adulthood, the results of the questionnaire give the following indicators (Fig. 1 and Fig. 2). Relevant fears in adulthood are fear for the lives of relatives and friends (46.9% in the total sample) because now this fear is already associated with one's own family. Fear for elderly parents (33.9% of the total sample). Fear of making a mistake or doing something wrong (32.3% of the total sample).

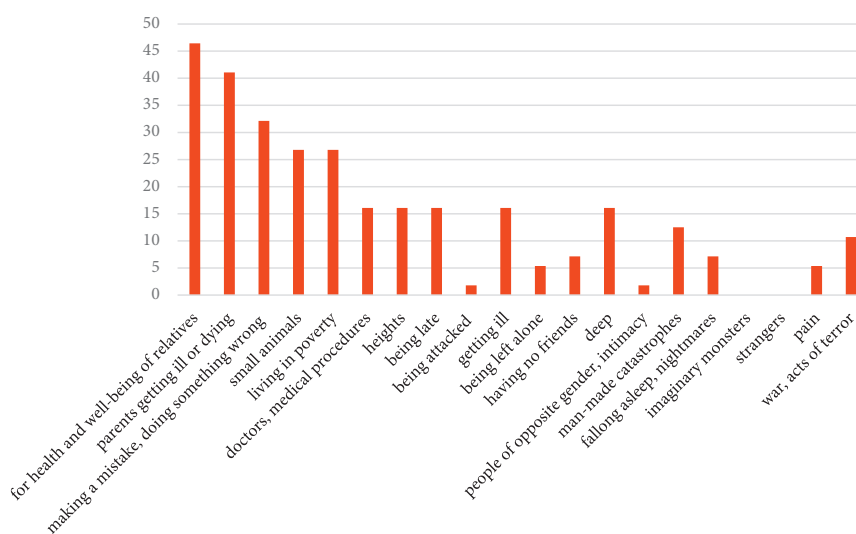


Figure 1. Graphic representation of the prevalence of childhood fears in adult life among men, in %

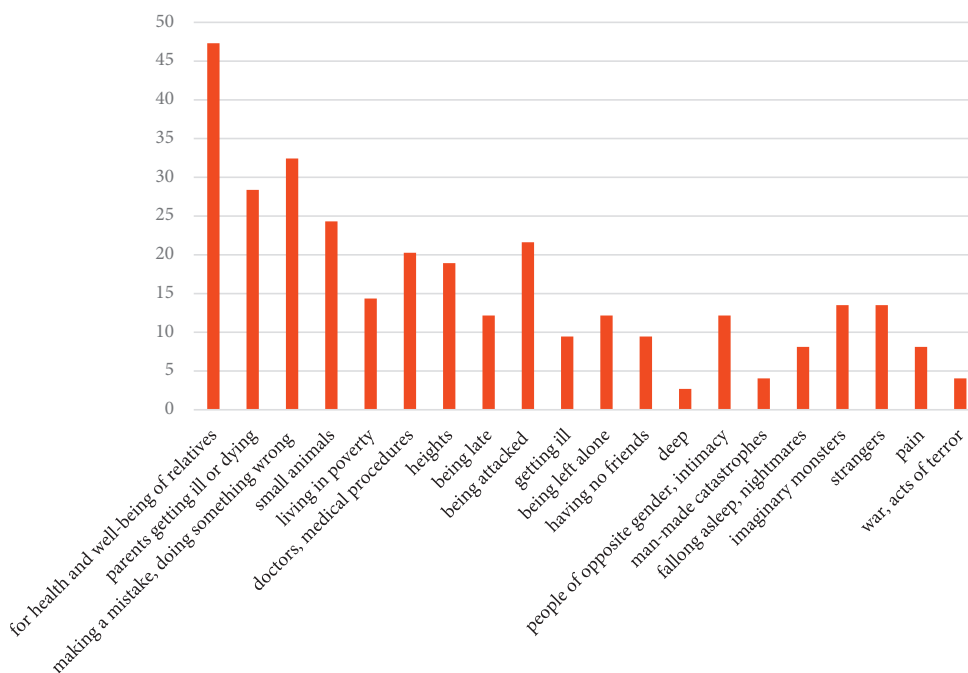


Figure 2. Graphic representation of the prevalence of childhood fears in adult life among women, in %

After analysing the results of the questionnaire, it is worth noting that childhood fears can be modified and rooted in the life of an adult through their long-term consequences. Therefore, according to this feature, fears can be arranged into four groups. The first is a group of fears that have a clearly negative impact. These are fears that are defined as childhood phobias (nightmares, fire, natural disasters, transportation). The second group is the absence of a substantial impact (daily fears, which include visiting doctors, donating blood, receiving injections, insects). This group of fears usually occurs in early childhood as instinctive-protective reactions and remains in the minds of individuals in the future. The third group includes fears that have an ambiguous impact, that is, they are characterised by both negative and positive results. The fourth group – fears that have a potentially stimulating effect. This group includes fears of social origin that develop during a person's education in school or in adolescence and remain for life. The manifestation of these fears is characterised by the development of tolerance for uncertainty. Therewith, there is a negative impact on the level of satisfaction with relationships that arise between individuals, personal anxiety and a tendency to codependent behaviour increase. Based on the type of fears, two indicators of the origin of fears are identified: social (those that, in addition to negative consequences, have a potentially developing effect that promotes adaptation by interiorising social norms) and destructive.

In the course of statistical data processing using the Pearson correlation coefficient, it was determined that the severity of constructive fear effectively correlates with the level of tolerance for uncertainty in T.V. Kornilova's questionnaire ($p \leq 0.01$). In this context, tolerance of controversial situations forms a fear associated with the discrepancy between a person's actions and social indicators. In turn, the fear of social inequality reflects the development and increase in the scope of responsibilities that concern the individual themselves ($p \leq 0.001$). Based on this, it can be argued that socially determined fears are characterised by fundamental differences in their adaptive capabilities. The predominance of constructive fears is manifested in a lack of rigidity and stereotypical behaviour. Both constructive and destructive fears are positively correlated with expressions of intolerance during interpersonal interaction. This is due to intolerance for manifestations of uncertainty and motivation for clarity about the process of establishing communication with third parties. An important role in the process of fixing such dependence is played by the prolongation of fears into adulthood [2].

Thus, these factors allow establishing that fears that arose in childhood are a source of stereotyping of a person during this interaction with the environment, in the perception of reality, and expression of emotions. Indicators of the manifestation of childhood and adult fears are characterised by a substantial negative ratio with the "intolerance" indicator of T.V. Kornilova's questionnaire. This is expressed in a decrease in the integral stereotype index. In particular, people who express a tendency to intolerance are characterised

by a smaller quantity and intensity of fear reactions. In addition, it is noted that the identical indicators of two more tools, the purpose of which is to analyse the level of stereotyping (MSTAT-I by D. McLain and tolerance-intolerance by T.V. Kornilova), reflect the ratio of both different importance and direction. This concludes that the tolerance-intolerance questionnaires taken in this scientific paper characterise various manifestations of psychic reality. In turn, fears of social origin depend on tolerance for uncertainty; they provide an increase in the level of demanding personality, reduce the level of self-perception, and also enable the development of codependent behaviour. The severity of any fears negatively affects the psychological perception of reality by an adult, causing a number of psychoemotional obstacles and even pathopsychological disorders.

DISCUSSION

The subject of fears can be considered in many ways because the emotion of fear can both mobilise a person to act, force them to respond to stimuli, demoralise, slow down any manifestations, and negatively affect all fields of a person's life. As part of this study, the analysis of fears is narrowed down to the emergence of stereotypical behaviour as a result of experienced childhood fears. All aspects of the study are considered alternately.

Focusing on the course and impact of fears, it is important to identify the causes of their occurrence and development. Personal and typological features of the nervous system and temperament characteristics are considered determinants of the manifestation of negative mental states. In relation to a number of social reasons, the conditions of upbringing in the family are distinguished, that is, the styles of parental attitude (hypersocialisation, rejection, etc.) toward the child. The occurrence of fears in childhood is associated with the level of anxiety of the child. Anxiety is understood as a negative emotion, which is expressed by a sense of uncertainty and the expectation of negative events. Like fears, it occurs in early childhood, when the child is alone for a long time, deprived of parental affection, fun games and, in general, attention from close adults. During the child's mental development, there are a number of age periods of hypersensitivity to fears. Special attention is paid to the fears of fictional objects (vampires, ghosts), temporary fears (animals, insects), and deep fears (loneliness). Over time, fear becomes a more complex feeling because it takes on different forms and types [11-13].

Thus, fears are a basic emotion and, if they are not lived through and resolved, they can disrupt the harmonious development of the individual, negatively affecting their formation. The consequences of fears are problems with socialisation, assimilation of maladaptive behaviours, and violations of both emotional and intellectual development, as they are interrelated. Destructive forms of behaviour are manifested by stereotyping actions that were formed under the influence of fears.

Stereotypes are pre-formed evaluative opinions about something [14]. Stereotypes are learned in the process of

socialisation, adopting the values, norms, rules, and attitudes of the society in which a person is located [15-17]. The family, as one of the social links, has a substantial impact on the development of the child and, considering the model of behaviour and upbringing in the family, the child learns certain information that is guiding them in the future. This is clearly demonstrated by gender stereotypes, where children are classified as “girls” and “boys” instead of being considered just “children”. Stereotypes are also fixed through a supportive behaviour model, that is, when a child performs a certain action, others can encourage them or

react negatively [18; 19]. For example, if a boy gets positive feedback every time he hits the ball, he will tend to repeat this behaviour. In turn, if he notices that some of his actions do not find the support of his parents, most likely the child will refrain from such behaviour in the future. Stereotypical roles are passed down from generation to generation through so-called differentiated socialisation, i.e. conventional roles such as “mother and housewife” for women and “father and breadwinner” for men. In most of these cases, adults are not aware of this when raising their children. Examples of gender stereotypes are displayed in Table 1.

Table 1. Examples of gender stereotypes

Girls	Boys
More obedient and strive to please others	Don't listen to instructions and are less attentive
Only like role-playing games, dolls, and caring for small children	Only interested in cars, trucks, and the process of building things
Quieter and more patient	More mobile
More prone to perfectionism and better at housework	Messier and less picky in the household
Get more toys, attractiveness of which is based on appearance	Usually get educational games that encourage active play
Have access to dolls and can take part in role-playing games, such as cook	Have access to active games, such as playing with toy cars and construction activities

Source: developed by the author of this study

Therefore, a child brought up by stereotypical models will have life difficulties in the future, because internal personal conflicts may arise due to dissonance between the needs of the individual and the requirements of society. For example, a boy grows up and dreams of becoming a ballet dancer, but the stereotypical attitudes that he learned in his parents' family do not allow him to follow the call of the soul, because “ballet is for girls”. Stereotypes affect various aspects of the lives of children, including academic success, career choice, attitudes to the distribution of family responsibilities, romantic relationships, perception of themselves and the world in general, expression of identity, etc. The investigation of stereotypes requires a thorough approach with an analysis of the causes and models of formation, mechanisms of work, and consequences.

In the structure of the stereotype, the following components are distinguished: emotional (positive or negative interpretation of signs) and cognitive, which determines the specific amount of knowledge about the element. It is important that in the stereotype, these objects are not characterised by stability, which is expressed in a frequent change in emotional properties. Stereotypes are filled with emotions, desires, beliefs, and are associated with fears, anxiety, or hope. The component that contributes to the activation of stereotypes is expressed in interaction with characteristic emotions. The prerequisites for the formation of stereotypes are contained in the past experience of the individual [20-22]. That is, there is an external action that does not cause any emotions – just a fact. As a result of personal impressions of this event, specific feelings are formed. As a result of repeating a certain similar event, a person identifies from their feelings what was already

associated with it. If this process is repeated several times, a certain belief is formed and fixed. In the future, the person pays attention to all the important “factors” that characterise and confirm this belief, which in turn allows for consolidating the “image – emotion” system. The formation of an emotional stereotype in a person's mind provokes the emergence of a contradiction between emotions and social factors of their reflection [4].

Interesting is the research devoted to the relationship between stereotypes and the procedure for perceiving and analysing social events or elements. It is investigated that stereotypes provoke an evaluative characteristic when an active mechanism of data exchange between subjects of different categories is conducted. Based on the theory of the functioning of stereotypes, its practical limits are defined and certain facts are established. Firstly, individuals easily express a willingness to describe ethnic groups or social groups with undifferentiated traits. Secondly, such indicators are characterised by stability over a long period of time. Thirdly, stereotypes of social origin can change as a result of the influence of social, economic, or political factors. Fourthly, stereotypes are fixed at an early age and are used by children long before they form clear ideas about the categories of people they relate to. In addition, stereotypes of social origin do not have a substantial negative impact, if there are no contradictions in the relations between social categories [5].

Stereotypes are characterised by emotional intensity, and this property polarises the element in the attention of the person. First, stereotypes belong to the list of cognitive objects that form and provide a positive “self-image”. An interesting idea is that the stereotype is both a schematisation

and a guarantee of personal self-respect; a reflection of one's own emotions and attitude to the outside world [5]. Secondly, the dynamism of the emotional background is characterised not only by the motive of providing a positive "self-image" but also the observance of value orientations that relate to the interiorised benefits and interests of a certain category of persons [23]. It is noted that the nature of the stereotype expresses important features, namely stability, duration of existence. The emotional basis of stereotypes

is a complex of negative experiences, states, and feelings. The dominant emotions are fear, feelings of shame, guilt, resentment, anger, irritation, aggression, sadness, etc. This complex is usually unconscious and is an integral factor that negatively affects interpersonal relationships because it provokes an increase in the level of emotional tension, distrust, and alienation in the individual. The general characteristics of the emotional component of interpersonal interaction stereotypes are presented in Table 2.

Table 2. Characteristics of interpersonal interaction stereotypes

Stereotype	Feature
Misunderstanding	People do not understand each other's behaviour and goals, creating emotional tension. It is expressed by emotional instability and aggressiveness
Domination	The desire to control and manage relationships, and demonstrate one's own superiority. It is characterised by optimism, combined with emotional instability, fear, tension, and aggression
Submission to the "strong"	The tendency not to express own desires and prefer the positions and ideas of others. It is reflected in the fear of being left alone in the future, increased anxiety, suspicion, and a tendency to self-blame
Search for the "guilty"	It is expressed in criticism, condemnation, and complaints, hostility towards others.
Picky attitude to "friends" and "strangers"	It is manifested in justifying a certain category of persons and accusing others. It is characterised by suspiciousness, anxiety, and vulnerability
Aggressive suppression of the "weak"	The aggressor attacks those who are weaker than them. Attacks occur in the form of shouting, scandal, insults, and beatings. It is characterised by defensive aggressiveness, a sense of hostility, and increased vulnerability
"Victim"	It is characterised by the position of the object of suppression or aggressive attack, dependence on unfavourable external conditions, certainty in misfortune, poverty, and pain. It can affect the increase in anxiety, fear for the future, and the development of emotions of emptiness and frustration
Avoidance	It is manifested in the desire to avoid painful contacts, characterised by increased anxiety, irritability, and anger

Source: developed by the author of this study

Thus, having analysed the subject of stereotypes more thoroughly, it is worth noting that stereotypes that were learned in childhood are quite negatively reflected in adult life. Therefore, it is worth considering and analysing the factors under the influence of which stereotypes are formed. First of all, these are patterns of behaviour in the parent family because it is the parents who are the role model for children. Therefore, it is important to focus on the methods of psychoprophylaxis of childhood fears and psychocorrection, if the fears have already arisen [24]. Psychoprophylactic work should be conducted in the following areas: organisation of activities for children that take place using dialogue, game approaches to interaction, and introspection and development of effective means of emotional response; cooperation with parents, for the timely implementation of preventive measures for negative psychoemotional states in adolescents (lectures, individual or group classes); preventive measures among the educational staff (organisation of seminars, lectures, meetings) to correct destructive styles of pedagogical communication and training in working with children, which are characterised by the expression of negative mental states and emotions. As for psychocorrective work, it can include both individual and group forms of interaction, psychohymnastics, projective drawing, modelling, positive reinforcement,

methods of modelling the situation, storytelling and musical therapy. The most effective methods can be recognised as psychohymnastic exercises for relaxation, response, and consolidation of positive behaviour patterns [11]. The consequence of stereotypical parenting is perfectly illustrated by the description of a person defined as an "authoritarian personality". The source of its formation and development is the principles fixed during child education, in particular, the specific features of interaction and relations with parents. In addition, it was identified that a substantial part of authoritarian people were characterised by strict discipline, and harsh disciplinary actions on the part of parents to fully control children and avoid possible manifestations of wrong behaviour.

CONCLUSIONS

Fear is a basic human emotion that is activated as one of the first in early childhood and accompanies at all age periods, performing extremely important social and psychological functions. The issue of analysing fears is important in the emotional field of the individual, because fears affect their structure, form character, consolidate behaviour patterns, and regulate social relations. It is not advisable to ignore the positive functions of fear – emotions, namely the signal function. However, as a method of education, fear

is a destructive emotion that disrupts the harmonious development of the individual. Education out of fear leads to the consolidation of obsessive stereotypes, which are quite clearly manifested in adulthood. This can also be seen in gender stereotypes, when family or social roles are clearly distributed by default, ignoring the needs of a person. Stereotypes create qualitative components in the understanding and perception of a person, which are very difficult to influence, in particular, to deform them, since they are characterised by a clear development, which usually occurs by a person without their awareness of this process. Stereotypes play an important role in the formation of consciousness, as they can simultaneously reflect both the social and psychological foundations of its development. Stereotypes are accompanied by acute interpersonal and intergroup conflicts, which is why it is important to notice them in oneself in time and change them so that they are not passed on to children or other people. Stereotypes also have positive functions, for example, when they act as a solution to a number of problems for a person and do not suppress their individuality.

The main study was aimed at establishing a link between childhood fears and the processes of tolerance and intolerance as an important factor in the emergence of the stereotyping mechanism. According to the results of the study, a positive relationship was established between the indicators, which proves the initial hypothesis. It is also important to note that, according to the method of identifying fears, the results among women and men differ substantially, which indicates stereotyping in upbringing. Fears that children experience in childhood and do not live through safely for themselves, take root and affect the formation of the psychological well-being of a person, causing a number of psychological problems. The analysed sources of information clearly indicate the need for further study and empirical research on the formation and manifestations of the emotional field in the life of an individual. From a perspective standpoint, the study of ways to eliminate stereotypical behaviour of parents and models of parenting in post-Soviet countries as a way to solve the problem of developing mental and psychological disorders in childhood can be of great practical importance.

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Формування стереотипів поведінки людини під впливом дитячих страхів

Анотація. Актуальність дослідження зумовлено наявністю залежності, що виникає між емоційним та інтелектуальним розвитком особистості. Негативні зміни в процесі емоційного розвитку людини призводять до того, що вона не здатна використовувати інші структури, зокрема інтелект, а отже, і гармонійного розвиватися. Як базова емоція, страх – невід’ємна ланка в емоційній сфері, так само як емоція радості, суму та гніву. Страх виконує захисну функцію, однак і руйнує особистість, якщо він ірраціональний. Емоція страху, виникаючи в дитячому віці, здатна закріпитись та трансформуватись у більш гострі вияви, тобто у фобійні розлади. Особистість формується під впливом суспільства, тож дуже важливу роль у її розвитку відіграють моделі виховання в родині та ті установки й приписи, які людина засвоює з дитинства. У дорослому віці ці моделі проявляються у формі стереотипної поведінки, яка значною мірою впливає на якість життя людини. Тож важливо прояснити, яким чином дитячі страхи здатні впливати на особистість в дорослому віці. Мета цієї роботи – установити зв’язок між дитячими страхами та стереотипною поведінкою. Задля досягнення мети використано низку методів та методик, серед яких теоретичні (аналіз, синтез, узагальнення) та практичні (Шкала толерантності до неоднозначності кількох типів стимулів Д. МакЛейна; опитувальник толерантності до невизначеності Т. В. Корнілова; анкета-опитувальник дитячих страхів). Результати дослідження свідчать, що в разі коли людина не може безпечно прожити страхи в дитинстві, вони мають вплив на психологічний добробут особистості, що спонукає до формування психологічних проблем. Доведено, що внаслідок гендерних стереотипів у вихованні сформовані в дитинстві чоловічі й жіночі страхи помітно відрізняються. Водночас зазначено, що окремі стереотипи мають позитивне значення в житті людини, якщо вони не пригнічують її психологічний розвиток. Матеріали дослідження будуть корисними для практичних психологів сфери освіти, соціальної сфери та для педагогів

Ключові слова: емоційна сфера, моделі поведінки, поведінка, емоції, особистість, страхи

UDC 159.96

DOI: 10.52534/msu-pp.8(4).2022.18-25

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The Role of Defence Mechanisms in Coping with Stress in PTSD Patients

Article's History:

Received: 26.08.2022

Revised: 30.11.2022

Accepted: 28.12.2022

Suggested Citation:Falova, O.Ye. (2022). The role of defence mechanisms in coping with stress in PTSD patients. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 18-25.

Abstract. In the context of the war in Ukraine, the risk of post-traumatic stress disorders increases, which in critical cases cause the development of chronic mental illnesses and a decline in physiological functions. In connection with the emergence of a feeling of helplessness due to the inability to act effectively in a dangerous situation, various psychological defence mechanisms are formed to overcome intrapsychic conflicts. The purpose of this study was to investigate the dominant mechanisms in individuals with post-traumatic stress disorder who had been in regions with different scenarios for the development of hostilities since the beginning of the war, using the Plutchik-Kellerman-Conte methodology. The information was collected from people of different age categories, types of employment, educational qualification levels, and gender who were in Kyiv, Kharkiv, and Lviv during the first two months of the full-scale war and periodically moved through the territory of Central and Western Ukraine. Cases of short-term residence abroad were also considered during the study. The results of the tension of psychological defence indicate that in individuals with post-traumatic stress disorder that stayed in different regions of Central and Western Ukraine since the beginning of the war, the projection mechanism dominated (75%), and the substitution mechanisms (12.5%) and denial mechanisms (12.5%) were equally distributed. The dominance of the projection may indicate the transfer of intrapsychic conflict to the outside. In this case, the external world is perceived by the individual as the main carrier of the threat from which they need to protect themselves. Instead, denial may indicate ignoring certain aspects of reality. Respondents who are prone to substitution use the approach of transferring repressed emotions, which can be expressed in the form of anger, fear, and hostility towards more accessible objects that are no less dangerous than those that led to frustrating experiences. It was determined that the total sample tension does not exceed 50%. This may indicate the ability of patients with post-traumatic stress disorder to resolve intrapsychic conflicts that have developed at the moment. The results of the study may be of practical interest to specialists investigating the identification and generation of methods for the prevention and treatment of post-traumatic stress disorder

Keywords: stress disorders, psychological defence, intrapsychic conflicts, physiological disorders, frustrating experiences, war in Ukraine

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INTRODUCTION

Post-traumatic stress disorder (PTSD) can develop as a result of exposure to a potentially traumatic life event. It is defined by three clusters of symptoms: 1 – reliving stressful events with the recovering of memories of them and a sense of fear; 2 – avoidance and numbness, provoked by the need to escape from the situation and negative feelings connected to it; 3 – excitation and reactivity, that cause nervousness or a sense of danger. Although this phenomenon is quite rare

among the sample that was subjected to trauma, there are a number of many factors that are triggers for predisposition to such a disorder: personal cognitive abilities, family psychiatric history, features of the process of psychological adaptation to trauma, violent treatment of children and unfavourable conditions that occurred in childhood, the nature of the severity of trauma [1-3]. The key factor is a situation that poses a threat to the life of an individual or

their relatives since it violates the sense of security of the individual [4; 5].

PTSD can occur at any age, but there are certain factors that indicate a predisposition to the disorder. These include: gender (women are more likely to develop PTSD); childhood trauma; feelings of helplessness or extreme fear; long-term experience of a traumatic event; lack of support after the experience; excessive stress after a previous traumatic event; a history of mental illness; use of psychoactive substances [6].

Under martial law in Ukraine, every fifth person living in the conflict zone suffers from some form of mental disorder. 22% of the population in areas where fighting is taking place have signs of depression, anxiety, post-traumatic stress disorder, bipolar disorder, or schizophrenia, with 9% of the population affected by conflict having moderate or severe mental illnesses. PTSD usually begins to appear about six months after the traumatic event. However, if the stressor has a strong long-term effect (for example, being in occupation, constant situations of shelling and air alarms, etc.), the probability of rapid development of PTSD increases [7]. It is relevant today to diagnose the dominant types of mechanisms of psychological response in conditions of stress caused by military events on the territory of Ukraine to provide timely and necessary psychological assistance and to resolve and prevent intrapsychic conflicts.

According to [8; 9], various defence mechanisms are associated with certain emotions and symptoms. Some of the mechanisms are correlated with each other. In particular, a link was established between the defence mechanism by projection type, hostility and paranoid disorder (correlation coefficients are 0.11 and 0.17, respectively). Regression correlates with hostility, anxiety, phobias, and depression (power of connection – 0.53; 0.40; 0.30; 0.37). Substitution is associated with anger and aggression; compensation is associated with depressive states; repression is associated with fear and passive behaviour; intellectualisation is associated with expectation and obsessive-compulsive disorder. The compensation mechanism is most strongly correlated with a permanent depressive state (0.22) [8].

The predominant defence mechanisms in patients with PTSD based on previous studies were projection, rationalisation, regression, denial, and substitution [5; 8; 10-12]. In the context of the study, attention is focused on the response of individuals among the sample that showed manifestations and was diagnosed with PTSD.

The purpose of the study is to investigate, using the Plutchik-Kellerman-Conte methodology, the prevailing defence mechanisms in persons with post-traumatic stress disorder who stayed in the territories of cities where military operations were conducted during the beginning of the war.

MATERIALS AND METHODS

Information was collected in writing in anonymous form from people of different ages, genders, educational, and qualification levels and types of employment, who during the first two months of the war were in the cities of Kyiv, Lviv, and Kharkiv, periodically moved around the territory of the Central and Western parts of the country, and lived abroad for a short period of time. Considering the organisation of respondents' security, the survey was conducted offline. Among the survey participants were both civilians and those who were directly involved in military operations. The total number of respondents was 150, which were distributed according to the eight criteria. The selection of participants was limited only on territorial grounds. No errors were identified in the calculation and interpretation of the collected data. Based on this study, it is quite possible to conduct a similar survey with a different number of respondents.

Criteria were used to diagnose PTSD in civilians and military personnel who have been in regions with different scenarios for the development of military operations during the beginning of the war. Criterion A – a person has experienced a life-threatening situation or a situation of serious physical injury or the likelihood of its occurrence. Criterion B – an obsessive re-experience of a traumatic event is present. Criterion C – the desire to constantly avoid everything that is associated with traumatic events. Criterion D – impaired cognitive processes or emotional states that were not observed or were less intense before the traumatic situation occurred. Criterion E – noticeable changes in excitation and reactivity of the nervous system after experiencing a threatening situation. Criterion F – the symptoms described in criteria A-E are present for a long time (one month or longer). Criterion G – the appearance of clinically substantial disorders of functioning of the body, problems in the professional and social fields. Criterion H – the disorders described above are not caused by the action of chemicals (medicines, drugs, alcohol) and are not a consequence of an epileptic crisis.

In the next stage of the study, the results of determining the psychological defences of the Plutchik-Kellerman-Conte methodology [9; 13] were identified, which indicate the presence of a tendency to give preference to certain protective mechanisms in resolving intrapsychic conflicts [12]. The mechanism is based on receiving unambiguous responses from respondents after evaluating a series of formulated statements describing feelings, behaviours, and reactions in certain life situations. Further data processing consisted of dividing the statements into 8 blocks, each of which reflected a separate psychological defence mechanism and counting positive statements (Table 1).

Table 1. Key to the Plutchik-Kellerman-Conte test

No.	Type of psychological defence	No. of the statement	Total number of statements of the block, N
1	Displacement	6-11-31-34-36-41-55-73-77-92	10
2	Regression	2-5-9-13-27-32-35-40-50-54-62-64-68-70-72-75-84	17
3	Substitution	8-10-19-21-25-37-49-58-76-89	10

Table 1, Continued

No.	Type of psychological defence	No. of the statement	Total number of statements of the block, N
4	Denial	1-20-23-26-39-42-44-46-47-63-90	11
5	Projection	12-22-28-29-45-59-67-71-78-79-82-88	12
6	Compensation	3-15-16-18-24-33-52-57-83-85	10
7	Hypercompensation	17-53-61-65-66-69-74-80-81-86	10
8	Rationalisation	4-7-14-30-38-43-48-51-56-60-87-91	12

Statistical processing is highlighted by indicators of tension (T_s , T_t), which are calculated by the percentage of positive statements of each block (or all positive statements) to the total number of statements of the block (or the total number of statements):

$$T_s = \frac{n}{N} * 100 \% \quad (1)$$

$$T_t = \frac{p}{92} * 100 \% \quad (2)$$

T_s – tension of a separate type of defence, %; n – number of positive statements of a particular block; N – total number of statements of an individual block; T_t – total tension, %; p – total number of positive statements of all blocks; 92 – total number of statements of all blocks.

Based on statistical processing of sample data using analysis in Excel, the results were obtained. In particular, the relative percentage distribution of the absolute tension of the diagnosed defence types, the average tension values within the entire sample were compared, and a correlation analysis of the mutual relationship between individual defence types was performed [14].

RESULTS

Analysis of literature data shows that stress becomes traumatic when, as a result of a stressful situation, disorders in the mental field occur, by analogy with physiological disorders. In this case, the structure of the “self”, the cognitive model of worldview, the affective field, the neurological mechanisms that control learning processes and the memory system change [5].

PTSD was diagnosed in 30 of the 150 people who were traumatised by military events. Symptoms [1; 15-17] were observed for at least a month. 40% of patients showed: anger, irritability, exaggerated fear reaction, excessive vigilance, sense of hopelessness. All respondents experienced obsessive and repeated disturbing memories of traumatic events. 50% showed a substantial decrease in interest in taking part in various activities. In 35% of respondents, chronic depression was identified, 25% suffered from sleep disorders and periodically had disturbing dreams related to military operations; avoided places, events, and people who reminded them of trauma; experienced flashbacks. 13% have constant hyperexcitation, the appearance of phobias, and alienation from social contacts. According to other researchers [5], patients with PTSD who took part in combat operations had similar disorders, in particular: sleep disorders (55%); neurasthenic disorders (52%); hypochondria (40%); depression (35%) difficulties in social contacts (30%); fear and phobia (30%); derealisation (25%).

Based on the relative percentage distribution of absolute tension values (T_s) different types of defence in the sample are dominated by projection (75%), substitution (12.5%) and denial (12.5%) are equally distributed (Fig. 1).

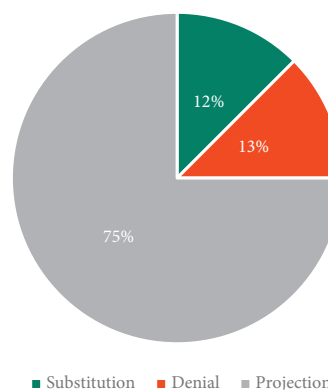


Figure 1. Relative percentage distribution of absolute tension

The last two types of defence predominate in middle-aged women. Therewith, the mechanism of denial is inherent in persons who did not change their place of residence during the war but were direct witnesses of military events. Constantly experiencing the same traumatic events, a person at a certain stage reaches such a level of tension that they can no longer perceive or evaluate phenomena that pose a threat to their self-preservation at all.

The tension of substitution dominates among people who were forcibly displaced to safe territories during the first days and therefore did not face traumatic factors physically in real time but had access to information about the course of events. The strongest emotion, in this case, was the fear of imaginary losses. Notably, such individuals very often experienced nightmares of real dangerous situations, accompanied by hyperrealisation of sensory sensations and hyperemotionality. Although these patients never directly encountered these events during wartime. Respondents showed anger, aggression, and a desire for revenge, probably to shift the focus from feelings of oppression and release emotions to safer and more accessible objects (instead of those that caused negative feelings).

The dynamics of the average tension value are traced from the sample data (T_s) (Fig. 2). As with the relative percentage distribution, the projection prevails. It manifests itself in 77% of people of different ages, genders, and conditions of stay. Rationalisation is next in tension (46%), while regression, displacement, compensation, denial, substitution, and hypercompensation are approximately equivalent.

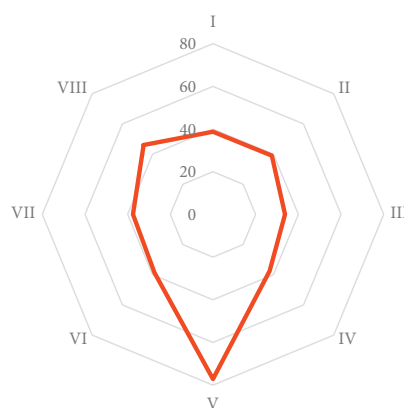


Figure 2. Average value of the tension of various defence mechanisms: I – displacement; II – regression; III – denial; IV – substitution; V – projection; VI – compensation; VII – hypercompensation; VIII – rationalisation

The dominance of the first two mechanisms coincides with the literature data [5; 8; 10; 11]. Previous studies have shown that rationalisation is the predominant mechanism for military commanders with PTSD. Patients most often used the following strategies to solve difficulties: immersion in work; cooperation with reputable people; search for people who are ready to give advice. They are capable of problem analysis of the situation and reducing the importance of the problem; do not suffer from low self-esteem; show optimism; suppress negative emotions; tend to passive cooperation with the delegation of authority to solve problem situations. Despite this, PTSD patients who have not experienced traumatic military events at all are more likely to show projection than rationalisation.

In general, there are two levels of personal defence [5] and overcoming trauma. In a minor intrapsychic conflict, the first (lower) level of defence is activated, which is manifested by denial, rationalisation, displacement, and compensation. Displacement allows removing unacceptable aspects of the conflict from the field of consciousness: the average level of tension of this mechanism is 39%. It can be traced in those dominants by projection and substitution who were not direct witnesses of military operations. A high level of tension by rationalisation type was observed among the entire sample array. Respondents tried to level confusion, panic, and feelings of guilt by creating logical justifications and searching for a “cause – effect” connection to reduce the importance of the causes of their traumatic situation [12; 18].

The average level of tension in the regression indicator was 39%. A high indicator of this mechanism was detected among residents of Kyiv, who lived in the city during the first month of the war, so they witnessed military conflicts. After moving to safe territories of the country and abroad, they tried to avoid memories of traumatic events and ignored the perception of information about the war, so they tried to level the intrapsychic conflict with various, sometimes practically irrelevant, types of occupancy.

With an indicator of 38.8%, respondents were diagnosed with compensation and displacement. When intrapsychic conflict increases, the first level of defence ceases to cope with a massively traumatic experience, so the individual's psyche uses the second level. It is represented by projection, substitution, and regression. This, in turn, leads to an increase in neurotic symptoms [5]. In this case, the intrapsychic conflict is displayed on the outside.

If in persons who did not directly witness the hostilities, the dominant mechanism was manifested at the level of 83-100%, then in those who lived in war conditions, the tension of the dominant defence was about 65%. This is evidently due to the correlation of some mechanisms with each other. Excel Mathematical Statistics (the CORREL function) and an encryption table of the reliability of the obtained coefficient depending on the sample number were used to determine the correlation coefficient (Fig. 3). For the amount of data used in the study, a positive value of the correlation coefficient exceeding the value of 0.36 is considered reliable [14].

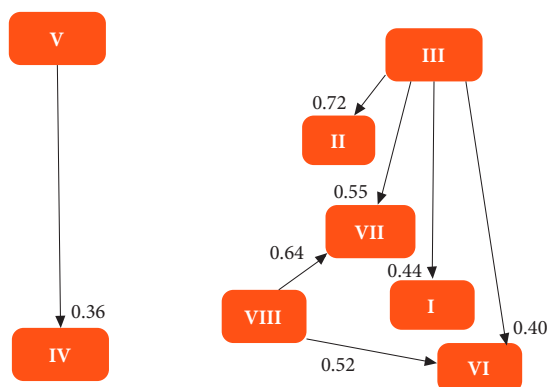


Figure 3. Correlation of various defence mechanisms: I – displacement; II – regression; III – denial; IV – substitution; V – projection; VI – compensation; VII – hypercompensation; VIII – rationalisation

As displayed in the figure, the strongest connection with other mechanisms is of the denial type. As the coefficient decreases, it correlates with regression, hypercompensation, displacement, and compensation with probability $p \geq 0.95$. Evidently, a lower level of defence is replaced by a higher one: first, there is an intrapsychic conflict (“I am not familiar with this, but I can explain it”), which is manifested to the outside world in the next step (“this is who is to blame for this/you must help me”).

The dominant projection was evidently the result of the transfer of internal conflict increased with time to the outside to weaken the sense of constant uncertainty. In some individuals, this was manifested by aggression, malevolence, a defensive reaction of arrogant humour, rejection, and paranoid thinking. Notably, the last two emotions coincide with the type of projection according to the previously performed correlation analysis [8].

The average overall tension score for the PTSD sample was 44%. The absolute indicator for respondents with the substitution type exceeded 50%. In persons who directly took part in military operations, according to earlier studies [5], this indicator was at the level of 61%, which indicates real, unresolved external and internal conflicts. Simultaneously, overall tension tends to increase with the worsening course of PTSD. The value of the average indicator of total tension of less than 50% may indicate the ability of respondents to resolve external and internal conflicts in the current conditions [19].

DISCUSSION

Over the past decade, the term “psychological defence” has often been introduced into the context of various scientific and popular papers on medical, social, age-related, and educational psychology. The nomenclature of protective mechanisms is not unambiguous and personally specific [20].

A. Froyd identifies ten defence mechanisms: regression, displacement, reaction formation, isolation, destruction, projection, introjection, the struggle of the “self” with itself, conversion, and sublimation (displacement of instinctive goals). The author tries to trace their formation in the ontogenesis of the child. With their help, a person can mislead themselves about the presence or absence of danger. The essence of defence is that in its process, the perception of the threat of danger decreases, and not the danger itself. The task of a practising analyst is to determine the effectiveness of defence in the processes of personal resistance and formulate a symptom that can be observed in different people. A. Froyd divided the methods of defence in two directions: the first is the fight against an internal threat, the second – against an external one. These methods can be arranged so that each mechanism of the first group corresponds to a specific mechanism of the second group. Evidently, an effective fight against an external threat should consider this external aspect, so, accordingly, it should be based on a number of real principles [21].

Defence mechanisms have some common features: they operate in the subconscious, and the individual is not

aware of what is happening to them. They deny, distort, or falsify reality and are activated in situations of conflict, frustration, psychological trauma, and stress. The main purpose of defence is to reduce emotional tension and prevent disorganisation of behaviour, consciousness, and the psyche in general. In this case, all the mental functions of the individual are involved, but each time, one, which takes on the main part of the work to prevent negative experiences, is dominant [22].

According to Plutchik’s classification, there are the following types of defence mechanisms: regression, displacement, substitution, denial, projection, compensation, hypercompensation, and rationalisation [20].

Regression is the process by which a person returns to an earlier or less mature stage of developing feelings and behaviours to avoid anxiety. Solving complex situational problems is replaced by simpler ones using more basic and familiar behavioural stereotypes. This contributes to the partial levelling of the development of conflicts. Displacement is a defence mechanism that begins with the manifestation of obsession and leads to the development of a consistent, internally coordinated attitude to break the associative connections of thoughts with actions [19; 20]. Denial is an attempt not to accept unwanted events as reality, another way to deal with troubles is to refuse to accept their existence. Remarkable is the ability in such cases to “skip” unpleasant experienced events in memories, replacing them with fiction. Projection is a psychological process that results in the internal being perceived as external. A person attributes to others their own thoughts, feelings, motives, character qualities, etc., believing that they have accepted something that happens outside, and not inside the person themselves. In essence, the projection is the “distancing” of the threat from oneself. Compensation is a defence mechanism of the psyche, which consists in an unconscious or conscious attempt to overcome real and imaginary shortcomings, restore the disturbed balance of mental and psychophysiological processes by creating an oppositely directed reaction or impulse. Hypercompensation is one of the forms of psychological defence, the implementation of which not only eliminates the feelings of inferiority but also achieves a certain result that allows taking a dominant position in relation to others. Rationalisation is a type of psychological defence that manifests itself in attempts to prove that any actions of the subject are universally correct, and therefore are not subject to criticism. Rationalisation is the most common mechanism of psychological defence [20].

Before the Vietnam War, few researchers were interested in diagnosing PTSD, treating it, and solving related problems. It took American psychiatrists and the Veterans Administration years to realise that the symptoms of PTSD in retired military personnel did not appear immediately after the end of the war, but already during civilian life, and lasted for decades. In the early 1970s, it became known that symptoms of PTSD also appeared in those who were not directly involved in combat operations. Although, not everyone who has experienced a traumatic experience develops

PTSD [15]. Trauma can greatly affect not only the immediate victims but also the people around them. It was identified that the grandchildren of Holocaust victims have much more pronounced symptoms than expected. This fact also applies to relatives of victims of military operations and persons who provided first aid on the front line, lawyers dealing with cases of traumatic events [15; 23].

Patients with PTSD, like healthy people, show psychological defence in response to a stressful situation. From the standpoint of clinical psychology, the phenomenon of defence is mutually related to adaptation to the situation. Defensive mechanisms develop in the process of ontogenesis and primarily act as liquidators of internal anxiety. In the future, they create an optimal atmosphere of correspondence between the individual and the environment in the process of familiar activities for a person without harm to physical and mental health [22].

Psychological defence can be divided according to the level of maturity [24] into protective (displacement, denial, regression) and defensive (rationalisation, projection, substitution). The first level is considered more primitive; it does not allow conflict-traumatic information to enter the mind. The second level makes this information accessible to consciousness but interprets it in the safest way possible. Defensive one is more pronounced, both in the military and in civilians with PTSD in war conditions.

In one study, the same mechanisms are dominant (both in those with PTSD and healthy people): projection, regression, and denial. However, the tension is different: in respondents with PTSD, the projection is manifested by 84%, while in healthy people – by 76%. In this case, the projection type tension (in wartime conditions) in patients with PTSD is 77%, which is even lower compared to the study [8] conducted in peacetime.

As for ordinary military personnel, 75% of them are dominantly characterised by denial [5]. In this case, denial is a clear distortion of the perception of reality and is manifested by the rejection of existing pathological symptoms, refusal of psychological assistance, and passivity in the rehabilitation process. The increase in the level of tension by the type of denial in the military is due to the fact that in everyday life a person creates defence mechanisms that allow perceiving death as something distant and unreal. Once on the battlefield, a person faces a direct threat to life. As a result, the worldview is divided into two parts: safe, peaceful and military, where every step can be the last, and everyone around can be the enemy. These two worldviews mutually exclude each other, forming denial as a type of psychological defence. In patients in peacetime, the tension of denial was 66% [8], and among respondents who did not take part in combat operations, but lived in war conditions, this average indicator was lower – 38%.

In addition to denial, rationalisation is largely expressed in the military (70%). In the presented sample of average tension values, this type also ranks second after the projection and is established at 46%. One of the goals of rationalisation is to neutralise affects, alienate them. Through

building hypotheses and theories, the individual tries to explain all the problems of their life by unfavourable circumstances and does not want to comprehend their own unrealisation. For military commanders and civilians who doubt the correctness of the algorithm of decisions and actions in stressful situations, this type of defence is necessary to explain their own actions, both in civilian life and in battle. This allows shifting the responsibility to circumstances or others and thus reducing the level of anxiety and emotional stress. In patients with PTSD in peacetime, the level of tension by rationalisation type was 44% [11].

Studies conducted in this paper show a correlation of denial with other types of defence: regression, hypercompensation, displacement, compensation, while projection correlates with substitution. Regression in respondents with PTSD in war conditions was manifested with an average tension of 39%, and in peacetime studies – 1.8 times higher [8]. Being in the midst of an emergency, the human psyche tends to regress to the level of an adolescent puberty crisis. The individual uses reflection to avoid anxiety by the regression mechanism. Therewith, consciousness turns to itself and analyses its mental state. It manifests itself in the ability of an individual to control the adequacy, integrity, consistency, completeness of their mental processes and the ability to direct these processes to solve the tasks set [25].

Compensation and displacement occur equally with 39% of the PTSD respondents. These indicators are equally determined in the participants of military operations. In war conditions, compensation is an attempt to adapt to peaceful life after experiencing traumatic events through the mental creation of a positive image of the world picture. Repression allowed eliminating from consciousness those experiences, events, and affects that were not neutralised through rationalisation or manifested into aggression through substitution. The type of substitution in the military can be traced with a tension of 60% [5], while in the study sample, this mechanism is established at the lowest degree (average value – 34%). The effect of this type of defence was manifested by outbursts of anger, increased irritability, which reduced adaptive capabilities and made communication difficult.

As intrapsychic conflict increases, correlative mechanisms replace each other: tension decreases by regression/compensation types, rationalisation/substitution/denial increases. The average rate of overall tension among military personnel with PTSD exceeds 50% when compared with respondents with PTSD who did not take part in combat operations, which indicates a different scale of internal unresolved conflict.

CONCLUSIONS

The predominant symptoms of PTSD patients who were traumatised by military events in Ukraine were: anger; irritability; exaggerated fear response; excessive vigilance; sleep disorders; combat-related dreams; a sense of hopelessness; constant hyperexcitation; avoidance of places, events, and people that remind of trauma; a substantial decrease in

interest in taking part in various social activities; alienation from people; obsessive and repeated memories of trauma; pseudo-reliving the disturbing events of the past (flashbacks).

After conducting a study on the mechanisms of psychological defence of such respondents, the relative percentage distribution of absolute values of tension among patients with PTSD is dominated by projection (75%), denial (12.5%) and substitution (12.5%) are evenly distributed. The denial is inherent in respondents who did not change their place of residence and were in the territory of military operations. Internally displaced persons from the first days of the war who have not directly witnessed the active phase of the military conflict are subject to substitution. The highest average value of tension in PTSD patients during the war in Ukraine is shown by projection (77%), the lower level of tension – by rationalisation type (46%), and the proportionate values are regression, displacement, compensation, and hypercompensation, denial, substitution (within 30-40%).

There is a correlation of varying strength ($p \geq 0.95$) between the types of substitution - displacement-regression - compensation - hypercompensation; projection - substitution; rationalisation - compensation - hypercompensation.

Evidently, the correlation is a confirmation of the transition of intrapsychic conflict to the external level due to a successive change in the mechanisms of psychological defence. The identified dominant mechanisms of psychological defence may indicate the formation of an adaptive response in respondents with PTSD. It consists of initial detachment from the situation, subsequent acceptance with the need for explanation and understanding, and, finally, abstraction from events through the transfer of internal conflicts to the outside. The average rate of overall tension in people with PTSD is less than 50%, which may indicate the ability of the sample at this stage to resolve external and internal conflicts caused by the traumatic situation. In the papers of researchers on the study of post-traumatic stress disorders in recent years, a narrower study of the disease prevails, considering not only the symptoms but also the development of specific mental diagnoses (insomnia, depression, obesity, etc.). These studies were the result of the rapid response of the scientific community to the coronavirus crisis, but now in Ukraine, there is another cause of these mental disorders – war, which must be investigated in detail by both Ukrainian and foreign researchers to ensure the mental, psychological, and physiological well-being of the world community.

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Роль захисних механізмів у подоланні стресу у хворих на ПТСР

Анотація. В умовах війни в Україні зростає ризик посттравматичних стресових розладів, які в критичних випадках зумовлюють розвиток хронічних психічних захворювань та порушення фізіологічних функцій. У зв'язку з виникненням відчуття беспорядності через неможливість ефективно діяти в небезпечній ситуації формуються різні психологічні механізми захисту для подолання інтрапсихічних конфліктів. Метою цієї роботи було дослідження домінантних механізмів у осіб з посттравматичним стресовим розладом, які перебували з початку війни в регіонах з різним сценарієм розвитку бойових дій, з використанням методики Плутчика-Келлермана-Конте. Інформація була зібрана від осіб різних вікових категорій, виду зайнятості, освітньо-кваліфікаційного рівня та статі, які перебували в Києві, Харкові та Львові впродовж перших двох місяців повномасштабної війни та які періодично переміщувалися територією центру та заходу України. Випадки короткотривалого проживання за кордоном також взято до уваги під час проведення дослідження. Результати напруженості психологічного захисту засвідчують, що в осіб з посттравматичним стресовим розладом, які від початку війни перебували в різних регіонах Центральної та Західної України, домінує механізм проєкції (75 %) і рівнозначно розподіляються механізми заміщення (12,5 %) та заперечення (12,5 %). Домінування проєкції може вказувати на переведення інтрапсихічного конфлікту назовні. У такому разі зовнішній світ особистість сприймає як основний носій загрози, від якого потрібно захищатися. Натомість заперечення може вказувати на ігнорування деяких аспектів дійсності. Респонденти, схильні до заміщення, застосовують підхід перенесення пригнічених емоцій, які можуть виражатися у формі страху, ворожості, гніву, на доступніші об'єкти, які не менш небезпечними, ніж ті, що призвели до фрустративних переживань. Установлено, що загальна напруженість вибірки не перевищує 50 %. Це може свідчити про здатність хворих з посттравматичним стресовим розладом вирішити інтрапсихічні конфлікти, що склалися на поточний момент. Результати дослідження можуть мати практичний інтерес для фахівців, що вивчають питання виявлення та генерування методів профілактики й лікування посттравматичного стресового розладу

Ключові слова: стресові розлади, психологічний захист, інтрапсихічні конфлікти, порушення фізіологічних функцій, фрустративні переживання, війна в Україні

UDC 159.923.33

DOI: 10.52534/msu-pp.8(4).2022.26-32

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Psychoemotional States of Men and Women in Separation from Their Families

Article's History:

Received: 10.09.2022

Revised: 06.12.2022

Accepted: 28.12.2022

Suggested Citation:

Tavrovetska, N.I., & Veldbrekht, O.O. (2022). Psychoemotional states of men and women in separation from their families. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 26-32.

Abstract. Due to the fighting, forced separation from family has become an urgent problem for many Ukrainians. The purpose of this study is to empirically investigate the impact of separation from family members on the psychoemotional state of men and women in war conditions. 332 respondents were interviewed using the following methods: the Cohen Perceived Stress Scale, the Connor-Davidson Resilience Scale, the hospital Anxiety and Depression Scale, and the positive and negative affect questionnaire by A. Klimanska, I. Haletska, the "List of traumatic events" questionnaire. Statistical analysis included a comparison of groups identified by the criterion of separation from relatives: 1) separated from a spouse or romantic partner, 2) separated from children, 3) separated from parents, 4) separated from many family members at once; 5) members of the control group had no changes in family composition. The results showed that the effects of family separation depend on gender. The absence of a male partner did not substantially affect the indicators of the psychoemotional state of Ukrainian women in the first weeks of the war. During the separation from blood relatives, negative changes were expressed in the actualisation of fears and vulnerability to possible dangers, and in the loss of a sense of joy (during separation from children); inattention, and confusion (during separation from parents). Compensatory mobilisation processes, increased vigilance, and concentration were identified in women who are globally separated from their families. Men were substantially less affected by separation from their relatives and showed an increase in the reaction of indignation. Therewith, the male and female subsamples did not substantially differ in the level of stress tolerance, resiliency, manifestations of depression and anxiety; but they differed in the perception of stress, the severity of positive and negative emotions. Women were more acutely aware of the uncertainty and tension of the life situation, their emotional reactions were dominated by depression, frustration, and anxiety. In turn, men in a war situation expressed more active reactions (concentration, determination, etc.), which prevailed over passive-negative ones. It is concluded that separation from the family threatens the psychological well-being and social adaptation of people who were forced to leave their homes due to the war. The obtained data help to better understand both the sources of psychotrauma and the resources for overcoming negative psychoemotional states in a situation of separation and suggest appropriate ways of psychological and social assistance

Keywords: family relations, attachment, breaking family ties, marital relations, parent-child relations, resilience

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INTRODUCTION

The aggravation of the war in Ukraine has actualised the problems of providing psychological assistance in stressful and post-traumatic conditions. Separation from the family at this time is quite a difficult event, which affects many adults and children. According to official data [1], at the beginning of June 2022, about 12 million Ukrainian citizens were forced to leave their homes, of which more than 5 million went abroad; the absolute majority of them are women with children. Investigating the psychological consequences of separation from the family will help to navigate the need for psychological interventions and their focus.

The family performs many important functions in the life of an adult, including psychotherapy, recreational-restorative, emotional, and spiritual communication, moral regulation, social protection, etc. The authors of the study suggest that the forced separation of family ties leads to frustration with basic needs and can negatively affect the psychological well-being of a person. Due to the attachment theory of J. Bowlby [2], in psychology, the negative effects of the separation of children from their parents were investigated in detail and explained, but almost no such studies were conducted in relation to adults.

According to current beliefs, attachment means a close biologically determined emotional connection between two individuals, characteristic of most mammals. The main function of forming attachment in a person is to provide care for a weaker being and protect it from dangers. An essential sign of attachment is that partners tend to stay physically and psychologically close to each other. Any attempt by a third party to separate a related couple is met with protest or active resistance; if they have to separate for any reason, each of them finds their other half and restores closeness. Although attachment behaviour is most pronounced in early childhood, it characterises human existence throughout life [2].

Usually, the very first and strongest bonds are formed between parents and their offspring (mother and child). With growing up, the intensity and frequency of attachment manifestations gradually decrease, but the corresponding patterns continue to exist until old age as an integral part of a person's behavioural response. In addition to parent-child relationships, they are complemented by new interpersonal connections: with intimate partners, spouses, their own children and grandchildren, friends, and even pets. J. Bowlby describes establishing the connection as falling in love with someone and maintaining it – as love. The threat of losing the object of attachment causes anxiety in a person, and true loss causes longing and sadness; any of these situations can also cause anger. The undoubted and reliable preservation of communication is experienced by a person as a source of security. Therefore, in adults, attachment behaviour is especially noticeable when a person is upset, sick, or afraid. Its individual manifestations depend on age, gender, life situation, and the experience of forming an attachment in the child's relationship with parents [2]. Attachment theory has explained the occurrence of many

behavioural, emotional, and personality disorders as a consequence of prolonged separation from the object of attachment (maternal deprivation) at an early age. In the following years, thousands of studies were conducted that convincingly confirmed the negative and long-term consequences of impaired child attachment development. In particular, difficulties in the psychosocial functioning of children and adolescents in families of conscripted military personnel are noted [3].

At the end of the 20th century, the study of attachment extended to the field of relationships at an older age. In 1987, C. Hazan and P. Shaver conceptualised romantic love as a process of attachment – in close relationships between adults, emotional connections are formed, similar to the attachments of a child and a mother. Romantic partners are just as eager to be close to each other and feel comfortable in the presence of their partner, as they feel anxious or lonely when their partner is absent. In addition, child-parent connections form mental models that determine the style of social relationships in adult life. Studies have shown that adults predictably differ in how they experience love and show types of attachment similar to the classical children's classification [4]. It is important that the emotional connection of adults, unlike early attachment, is symmetrical: both partners act as a source of a sense of security and comfort for each other.

Later, K. Bartholomew and L.M. Horowitz substantiated the typology of adult attachment in terms of the positivity of self-image and the positivity of the image of another: reliable (safe), dependent (anxious), detached (dismissive-avoidant), and anxiety-avoidant (phobic) types; described interpersonal difficulties associated with each type [5]. Today, there is a lot of empirical evidence that deviation from a reliable style of romantic and interpersonal attachment is closely associated with impaired and unstable self-esteem [6; 7], a tendency to depression [8], strategies for regulating emotions [9], vulnerability to stress and overcoming it [10; 11]. In the review work, R.A. Bryant emphasised the evolutionary importance of social connections and the benefits of attachment to overcome difficulties and discussed the potential impact of trauma on the attachment system [12].

In recent years, there have been separate attempts to analyse the experience of separation from family as a factor that increases the stress and suffering of forced refugees, causing distress and mental health disorders [13-15]. Thus, according to B.J. Liddell et al. separation from the family has a lasting impact on the psychological well-being of a person, the main causes of which are a feeling of constant fear, insecurity, breaking social ties, and changing identity in relation to the future "self" [14]. However, on an empirical level, the psychological consequences of prolonged separation from attachment objects in adulthood remain poorly understood.

The purpose of this study is to determine the features of the psychoemotional states of Ukrainians in war

conditions and identify the impact of separation from family members on the ability to adapt to stress.

Such a study is being conducted in Ukraine for the first time, its results will allow clarifying the factors of development of adaptive disorders in war conditions (primarily in military families, residents of the occupied territories, and forced refugees), and identifying the resources for overcoming stress, based on which, effective psychological interventions and means of social support can be offered.

MATERIALS AND METHODS

In May-June 2022, a survey was organised regarding the experience of stress by Ukrainians during the war. Invitations with a link to the Google form were posted on social networks. A total of 358 people aged 14 to 70 from different regions of Ukraine took part in the survey. The preliminary selection of participants was conducted according to the family situation: the results of respondents who did not indicate whether they were separated from their relatives,

and those who wrote poorly distributed answers, indicating grandparents, brothers and sisters, and friends as the object of separation, were removed. Finally, the sample included 332 people, including 273 women (mean age 33.7 ± 12.2 years) and 59 men (mean age 28.0 ± 10.1 years). Half of the respondents (51.5%) remained in a permanent place of residence since the beginning of the war; 6.9% temporarily left for safer territories, but returned home; 17.8% moved to other cities of Ukraine, and 18.4% went abroad.

The sample was divided into groups according to the answer to the question "Are you currently separated from your family members with whom you lived together before the war?". Participants were offered four options: a) no, nothing changed; b) yes, I am separated from my spouse (romantic partner); c) yes, I am separated from my parents; d) yes, I am separated from my children. It was possible to choose several answers or write one's own. Accordingly, a control group and four experimental groups were identified (Table 1).

Table 1. Selection criteria and number of experimental groups

Indicator	Group 0 (control): no changes	Group 1: separation from spouse/partner	Group 2: separation from parents	Group 3: separation from children	Group 4: separation from most family members	Total
Men	29	14	6	3	7	59
Women	127	55	25	18	48	273
Total	156	69	31	21	55	332

If a person specified more than one response, they were included in a separate group. This case is considered as a more global separation when a person does not receive the usual social and psychological support and experiences frustration with most of the needs associated with family functions.

The following methods were used for psychological diagnostics:

1. The Sh. Cohen Perceived Stress Scale (PSS-10) (Ukrainian-language adaptation by O.O. Veldbrekht and N.I. Tavrovska, 2022) defines the degree to which a person perceives their life situation as stressful, that is, unpredictable, uncontrolled, and overloaded. It contains 6 direct and 4 reverse questions with a 5-point Likert scale from 0 (never) to 4 (very often), with which respondents evaluate the previous month of their life. The total measure of perceived stress directly reflects how external demands exceed a person's ability to cope with them [16]. The average trends in the sample were 25.16 ± 6.92 ; the data distribution has a pronounced asymmetry and is shifted to the high indicators zone.

2. The Connor-Davidson Resilience Scale (CD-RISC 10) is aimed at analysing the "psychological elasticity" of the individual. This is a set of personal traits and dispositions that help a person constructively overcome challenges and threats, and quickly recover from life's traumas. It contains 10 direct questions with a 5-point Likert scale from "never" to "almost always"; high scores indicate a person's developed stress tolerance and resilience. The Ukrainian version of the

scale was created by the authors team under the leadership of I.I. Shapoval in 2020 [17]. The average trends in the sample were 26.25 ± 6.39 , and the data distribution meets the normality criteria.

3. The Hospital Anxiety and Depression Scale allows identifying symptoms of mood disorders that affect a person's quality of life. It contains 14 questions with multiple choice answers from 0 to 3 points; the scores obtained are distributed equally between the scales "Depression" and "Anxiety", directly reflecting the level of corresponding disorders. The Ukrainian version of the methodology is provided for non-commercial use by the copyright holder Mapi Research Trust based on the signed license agreement of the main user "MULA" and the author of the study. For the anxiety subscale, the average group norms of Ukrainians during the war were 9.74 ± 4.21 , and for the depression subscale – 7.62 ± 3.86 ; both variables are distributed normally.

4. The questionnaire on positive and negative affects (OPANA), created by M.B. Klimanska and I.I. Haletska in 2020 [18]. It consists of a list of 10 positive and 10 negative descriptors, which respondents rated according to how they felt over the past few weeks (from 1 to 5 points: from almost or not at all – to greatly). The result is two averaged scores of positive and negative emotion subscales. The sample averages were 2.91 ± 0.83 for the positive affect scale; 3.24 ± 0.90 for the negative affect scale; in both cases, the distribution met the normality criteria. In addition to

integral assessments, statistics of each item reflecting individual emotional responses were considered. The list was supplemented with 7 positions that are indicative of the initial stage of the war: insecure, disappointed, confused, resentful, exhausted (tired), feeling ashamed, proud.

5. The "List of traumatic events" questionnaire, formed based on the Life Events Checklist for DSM-5 to identify potentially traumatic events in life [19, p. 141]. It contained 12 items that covered the dangers common during the war: fire or explosion; transport accident; physical attack; taking captive or hostage; severe human suffering; substantial material damage, etc. Participants noted the level of impact of each event using a nominal scale of six options, and could note several responses at once: a) it happened directly to me; b) I witnessed the event; c) it happened to my relative or friend; d) this is part of my job; e) I feel it as a relevant threat; f) it does not apply to me. The frequency of selecting each answer option in individual forms was calculated to obtain quantitative indicators of life saturation with stressful events.

Parametric and nonparametric criteria were used to

compare the data of the five groups. In the case of a normal distribution of the variable (the criterion of excess and asymmetry, the Kolmogorov-Smirnov criterion) and equality of group variances (the Leven criterion), the authors relied on the results of univariate analysis of variance; a posteriori array comparison was conducted according to the Bonferroni criterion. In other cases, calculations of the Kruskal-Wallis criterion were used. A difference in which the significance of the statistical criterion was less than 0.05 was considered reliable; cases $p \leq 0.10$ were considered as a tendency to differences. Pearson correlation analysis was used to clarify the relationships between quantitative variables. Calculations were performed using IBM SPSS Statistics 22.0 software.

RESULTS AND DISCUSSION

When analysing the data of the entire sample, no substantial differences were identified between the results of the groups. Therefore, the data set was divided into male and female subsamples, after which the analysis was repeated considering the gender of respondents. Substantial differences were identified, mainly in the female subsample (Table 2).

Table 2. Mean scores and group differences in the female subsample (273 people)

Indicator	Group 0: unchanged (N = 127)	Group 1: separation from husband (N = 55)	Group 2: separation from parents (N = 25)	Group 3: separation from children (N = 18)	Group 4: separation from most family members (N = 48)	Value of the difference
Age	33.28	29.40	31.76	50.00 ↑	34.62	0.000***
PSS-10: Perceived stress	25.51	26.53	26.76	24.78	26.48	0.821
CD-RISC 10: Resiliency	26.45	25.02	25.60	25.67	26.52	0.688
HADS: anxiety	9.79	9.69	9.32	9.61	9.54	0.987
HADS: Depression	7.76	7.11	7.24	7.00	7.81	0.768
PANAS: Negative affect	3.29	3.36	3.48	3.28	3.31	0.892
PANAS: Positive affect	2.93	2.83	2.54	2.81	2.93	0.301
– joyful	2.61	2.78	2.24	1,71 ↓↓	2.54	0.005**
– full of energy	2.80	2.53	2.16	2.50	2.58	0.067
– collected, focused	3.27	2.81	2.52 ↓	2.78	3,37 ↑	0.000***
– mindful, vigilant	3.62	3.14	2.88 ↓↓	3.44	3.58	0.011*
List of traumatic events:						
A) it happened to me	0.41	0.80	0.60	0.56	0.73	0.149
B) I witnessed the event	0.97	1.38	0.68	0.78	1.58	0.048*
C) it happened to my relative or friend	1.59 ↓	2.93 ↑	1.92	2.44	2.37	0.018*
D) this is part of my job	0.24	0.23	0.04	0.44	0.35	0.909
E) I feel an urgent threat	5.36	4.04	6.36	7.28 ↑	4.88	0.022*
F) this does not apply to me.	5.26	5.11	4.72	2.83	4.87	0.130

Notes: * substantial difference at $p \leq 0.05$, ** – at $p \leq 0.01$; *** – at $p \leq 0.001$; arrows indicate the average indicators of groups that showed a substantial difference according to the data of a posteriori array comparison

The study showed that separation from family members was an insubstantial factor that did not affect the emotional state, perceived stress, resilience, anxiety, and depressive manifestations of respondents. Most likely, due

to modern communication technologies, family relations are not destroyed in the physical absence of a person. This assumption is supported by the fact that when answering the open question "what supports you most?" the study

participants (all groups without exception) indicated support from relatives, taking care of other family members, constant contact with relatives, and awareness that close people are safe. Similar answers were given by 33.4% of respondents.

In representatives of the *control group*, substantially fewer people report traumatic events and problems that have occurred with their friends or relatives (indirect stress). This may be the result of the functioning of the family as a kind of closed system that protects its members from outside influences. Instead, when separated from family members, a woman is forced to resort to weaker social ties: she restores contact with friends, colleagues, and distant relatives, and finds herself in a broader and simultaneously potentially traumatic information field.

Women who are *separated from their husbands* or partners are more likely to report tragic incidents that have occurred with their friends or relatives. On the one hand, it can be a sign/consequence of a broader network of social connections that allows women to be informed about what is happening in other people's lives. On the other hand, it can be a source of indirect stress or secondary trauma (but this assumption is not supported by data from other methods).

In the group of *women separated from children* a substantially lower level of joy was identified. This is easily explained by the influence of maternal attachment. Notably, the age of women in this group is substantially higher than in others (50.00 ± 10.98 years), so this mainly refers to separation from adult children. This group is also characterised by an increased sense of fear – they perceive traumatic events proposed for analysis in most cases as an actual threat to themselves. Perhaps this result is influenced by the age factor. Correlation analysis showed that in the female group, age positively correlates with the relevance of threats and fears ($p = 0.003$), negatively – with the perception of stress ($p = 0.003$) and the severity of negative affect ($p = 0.023$).

An interesting result was identified in relation to the assessments of the emotional state of “concentration, focus”, which substantially decrease in three groups of women:

separated from a partner, parents, or child (compared to the control group), but simultaneously increase and reach the highest level if a woman is *separated from most of the family members* (group 4). This group also has high ratings of mindfulness and vigilance but most often witnesses tragic events that can cause mental trauma. Only 9 representatives of this group live in their permanent place of residence, 79.2% left their homes, most of them went abroad. The evacuation/relocation factor explains the separation from loved ones and the traumatic experience gained, including protective mobilisation reactions.

Regarding the variable “full of energy”, an intergroup difference was identified at the trend level ($p = 0.067$). The highest scores were obtained in the control group, the lowest – in women, who were forced to *separate from their parents*. In addition, group 2 has the lowest levels of concentration, mindfulness, and alertness, and a relatively high level of relevant fears. Thus, separation from parents causes certain disorganisation in women. This confirms the position of Bowlby's theory that childhood attachment persists for many years and serves as a source of security even for an adult.

Men who are separated from their families most often indicate that adversity and danger are part of their profession (χ -square is 11.25, the value of the Kruskal-Wallis criterion is $p = 0.024$). Most likely, in the male subsample, separation from loved ones is due to professional duties – direct involvement in combat operations and other activities that serve the Armed Forces of Ukraine, TRO, and rescue and rapid response services. The only indicator that substantially differs in the comparison groups is the severity of the negative emotional state “resentful” (χ -square is 10.70 with $p = 0.030$). The lowest level was identified in the control group (3.03 ± 1.18), and the highest – in the groups separated from parents and children (4.33 ± 0.52 and 4.67 ± 0.58 , respectively). Due to the small size of the male subsample, these results require additional verification. In connection with the chosen research methodology, the gender differences of the measured indicators are considered (Table 3).

Table 3. Comparative analysis of average trends in subsamples of different sexes

Diagnostic parameters	Women (N = 273)		Men (N = 59)		Comparison	
	Mean value, M	Standard deviation, SD	Mean value, M	Standard deviation, SD	t-criterion, emp.	Value (bilateral)
Perceived stress scale	25.95	6.60	21.49	7.22	4.63	0.000***
Resilience scale	26.04	6.53	27.22	5.66	-1.28	0.200
Positive affect	2.87	0.84	3.14	0.74	-2.28	0.023*
Negative affect	3.33	0.87	2.83	0.93	3.90	0.000***
Anxiety	9.67	4.09	10.08	4.73	-0.68	0.494
Depression	7.54	3.85	7.98	3.95	-0.80	0.423

Notes: * substantial difference at $p \leq 0.05$, ** – at $p \leq 0.01$, *** – at $p \leq 0.001$

The results showed that women and men do not substantially differ in the level of stress resistance and resilience, including in the severity of depressive or anxiety symptoms. Therewith, substantial differences were identified in the level of stress perception, indicators of the severity of positive and

negative emotions. Women are more acutely aware of the uncertainty and tension of the current life situation; their emotional reactions are dominated by negative affect – the dominant reactions are depression, frustration, fright, and anxiety. Men in a war situation, on the contrary, have more

pronounced positive reactions (concentration, attentiveness, and determination), which prevail over negative affects.

All this requires considering gender differences in the analysis of psychological phenomena associated with war.

Previous studies of refugees conducted in different countries of the world partially confirm the results obtained. The experience of separation from the family is recognised as one of the main sources of stress, which causes mixed emotions in displaced persons and is experienced by them as a feeling of helplessness and fear for the family, who are still in danger. All of this affects the symptoms of anxiety, depression, and PTSD [13]. In this study, no such effect was identified – this can be explained by the fact that at 8-10 weeks of martial law, separation was mainly perceived by respondents as a temporary phenomenon, and it takes a certain amount of time for the above effects to occur. In the research of B.J. Liddell et al., a separated group of migrants reported a stronger impact of potentially traumatic events and a higher level of life, social, and economic difficulties compared to the unseparated group. Considering factors of potentially traumatic events, age, and gender, separation from family members was a predictor of post-traumatic stress and symptoms of depression [14; 15]. According to the data of previous researchers, the authors of the study suggest that the results obtained in their survey reflect the initial stages of the development of the corresponding disorders.

The study showed that separation from husband or romantic partner had little effect on the perception of stress and mood indicators of Ukrainian women in the first months of the war. In turn, when separated from blood relatives, substantial negative changes are observed, which are expressed in the actualisation of fears and vulnerability to possible dangers. Separation of women from their children is accompanied by a depressed mood, loss of a sense of joy; when separated from their parents, there is a substantial decrease in indicators of attentiveness and concentration (this shows the influence of early attachment). Women who are

separated from many members of their family at once, on the contrary, experience mobilisation processes, which are expressed in an increase in vigilance, attentiveness, and concentration. This shows the compensatory and adaptive capabilities of the psyche.

The psychoemotional state of men was substantially less affected by separation from relatives when compared with women. In general, their psychological state is dominated by emotions that contribute to the mobilisation of protective resources and overcoming a crisis situation.

The survey showed partial gender differences in the perception of acute stress caused by war. Therewith, the basic coping capabilities of men and women have the same level, although they may differ in qualitative features. Sources and resources of stress tolerance are the most relevant prospect for further research on the subject under study.

Notably, the study does not consider the existing family composition, the duration of separation, and the current model of attachment, only partially considers the life circumstances in which Ukrainian men and women find themselves during the war (primarily relocation), which, along with the destruction of family ties, are also sources of severe stress. Admittedly, the work started provides valuable information both about the importance of family ties in crisis circumstances and the factors affecting the experience and overcoming stress. The study that has been initiated needs to be continued, considering other war traumas that destroy human health.

AUTHORS' CONTRIBUTION

Regarding the author's personal contribution, N.I. Tavrovetska is the author of the idea of the study; literature analysis and adaptation of methods, collection of empirical data, formatting of the text were also conducted by the researcher. O.O. Veldbrekht – adaptation of methods, collection of empirical data, statistical processing, and interpretation of the results.

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Психоемоційні стани чоловіків та жінок у розлуці з родиною

Анотація. Через бойові дії вимушена розлука з родиною стала актуальною проблемою багатьох українців. Мета цієї роботи – емпіричне дослідження впливу розлуки зі членами родини на психоемоційний стан чоловіків та жінок в умовах війни. Було опитано 332 респондентів за допомогою методик: Шкала сприйнятого стресу Коена, Шкала резильєнтності Коннор-Девідсона, Госпітальна шкала тривоги та депресії, Опитувальник позитивного і негативного афекту А. Кліманської, І. Галецької, анкета «Перелік травмивних подій». Статистичний аналіз передбачав порівняння груп, виділених за критерієм розлуки з ріднею: 1) перебуває в розлуці з подружжям або романтичним партнером, 2) розлучені з дітьми, 3) розлучені з батьками, 4) розлучені відразу з багатьма членами родини, 5) члени контрольної групи не мали змін у складі родини. Результати показали, що ефекти розлуки з родиною залежать від статі. Відсутність чоловіка-партнера суттєво не вплинула на показники психоемоційного стану українок в перші тижні війни. Під час розлуки з кровними родичами негативні зміни виражалися в актуалізації страхів і вразливості до можливих небезпек, а також у втраті відчуття радості (під час розлуки з дітьми); неухважності, незібраності (під час розлуки з батьками). У жінок, глобально відокремлених від родини, виявлено компенсаторні мобілізаційні процеси, зростання пильності й зібраності. На чоловіків розлука з рідними вплинула значно менше й виявилася в зростанні реакції обурення. Водночас чоловіча та жіноча підвибірки достовірно не відрізнялися за рівнем стресостійкості, резильєнтності, проявів депресії та тривоги; але різнилися в сприйнятті стресу, вираженості позитивних і негативних емоцій. Жінки гостріше сприймали невизначеність та напруженість життєвої ситуації, у їхніх емоційних реакціях переважали пригніченість, розчарування, неспокій. Натомість у чоловіків у ситуації війни виражено більш активні реакції (зібраність, рішучість, тощо), що переважали над пасивно-негативними. Зроблено висновки про те, що розлука з родиною загрожує психологічному благополуччю та соціальній адаптації людей, які вимушено покинули власний дім через війну. Отримані дані допомагають краще зрозуміти як джерела психотравми, так і ресурси подолання негативних психоемоційних станів у ситуації розлуки, запропонувати відповідні шляхи психологічної та соціальної допомоги

Ключові слова: сімейні стосунки, прив'язаність, розрив родинних зв'язків, подружні стосунки, батьківсько-дитячі стосунки, життєстійкість

UDC 159.98

DOI: 10.52534/msu-pp.8(4).2022.33-42

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The Role of Cognitive Distortions in Young Women's Body Image Perception

Article's History:

Received: 29.08.2022

Revised: 26.11.2022

Accepted: 28.12.2022

Suggested Citation:

Yablonska, T.M., & Kacheniuk, A.Ya. (2022). The role of cognitive distortions in young women's body image perception. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 33-42.

Abstract. The analysis of modern psychological research and the practice of psychological assistance indicates the relevance of the problem of body image, especially for girls and young women. Therewith, most of the available papers focus on the study of the body image of adolescent girls, which makes it necessary to clarify the predictors of body image in other age periods. The purpose of the study is to highlight the results of a theoretical and empirical study of the role of cognitive distortions in the perception of the body image of adolescent girls. The methodological basis of the research was T. Cash's cognitive-behavioural concept of understanding body image, the interpretation of psychological mindedness by H. Conte, and A. Freeman's theory of cognitive errors. The role of various factors in the perception of body image is considered: 1) cognitive distortions as one of the predictors of an irrational strategy of human behaviour and thinking; 2) interest in one's own personality and understanding of one's own experiences as a factor of full self-acceptance. A Multidimensional Body-Self Relations Questionnaire-Appearance Scales by T. Cash, Cognitive error questionnaire by A. Freeman and R. DeWolf, psychological mindedness scale by H. Conte, and the author's questionnaire were used. The study confirmed the influence of social stereotypes on the perception of young women's own body image. In particular, it is identified that a substantial number of respondents (78.3%) emphasise the existence of social standards and express a desire to lose weight or change the shape of their bodies. It was determined that 71% of respondents have a normal body weight, which does not require changes in terms of health. Correlation analysis showed weak to moderate associations between women's psychological mindedness indicators and how they perceive their own bodies. A comparison of groups of women who expressed a desire to change their own bodies with women who did not have such a desire identified substantial differences between these groups in the severity of cognitive distortions, such as catastrophisation ($p \leq 0.01$) and trust in criticism ($p \leq 0.05$). The use of regression analysis confirmed the substantial impact of catastrophisation on how respondents perceive their own body image. There is also a moderate association between catastrophisation and the desire and willingness to discuss their own experiences, which should be considered when creating methods of psychological assistance for women with an irrational perception of their own body image

Keywords: self-assessment of appearance, psychological mindedness, cognitive errors, catastrophisation, trust in criticism, correlation analysis

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INTRODUCTION

The image of one's own body is an essential component of each person's self-esteem; it plays an important role in the self-attitude of the individual, which also affects the self-regulation of their behaviour. Modern psychological studies and psychological practice show that the negative perception of body image is very relevant for women, especially at a young age. Therewith, there is an insufficient number of modern psychological studies devoted to the examination of predictors of the problem of negative body image in young women, which can lead to substantial negative psychological consequences and health problems, including, in particular, such serious eating disorders as anorexia, bulimia, etc.

Analysis of psychological studies shows that most of them are focused on investigating the body image of teenage girls because at this age there are substantial changes associated with the hormonal restructuring of the body. In studies, the external environment (influence of peers, family, mass media), eating disorders, and bad habits are considered predictors of body image [1-3]. In Ukrainian psychological science, this area of research is not sufficiently developed, in fact, there are separate studies in this area [4; 5], which do not cover all aspects of the problem.

As noted in studies [2; 3; 6], some adolescent girls successfully overcome the problems of this sensitive age period and move into a new stage of life without any negative consequences associated with body image, but there are many girls whose problems worsen in adolescence. Researchers emphasise the substantial influence of socio-cultural factors on the development of women's body image, especially at a young age, when through the assimilation of social stereotypes and expectations, social comparison, girls build their own ideals regarding appearance and try to achieve them by changing eating behaviour [2; 3; 6]. Therewith, it can be assumed that certain individual psychological factors also play an important role in the development of the body image of young girls, in particular, cognitive distortions of the psyche and the ability of self-reflection (self-awareness). Therefore, this age period deserves special attention, because a negative body image in adolescence indicates the existence of influencing factors that can lead to problems with psychological health, eating disorders, depression, and anxiety disorders.

The purpose of the study is to analyse the role of cognitive distortions in the perception of the body image of adolescent girls, which can be useful for creating psychocorrective and psychotherapeutic programmes.

LITERATURE REVIEW

The concept of body image

The analysis of modern psychological studies of body image, in particular, as a predictor of eating disorders, indicates a variety of methodological approaches. Thus, there are many approaches to defining the concept that reflects a person's perception of their own body, in particular: "physical self", "bodily experience", "bodily self", "physicality" etc. This

study uses the concept of "body image" as well-founded and most common in modern psychological research.

According to the American Psychological Association (APA), body image is a mental picture of one of the body forms in general, which includes the physical characteristics of the body and attitudes to these characteristics. According to the National Eating Disorders Association, body image is how a person relates to their own body and its shape, how they physically feel in their own body [7].

Body image, according to the views of modern psychologists, can be positive or negative [8-10]. A positive body image means that a person feels comfortable in their own body, regardless of whether it corresponds to socially accepted ideals, and is associated with the ability to correctly and rationally assess their own shape, weight, body condition, combined with a sense of satisfaction from their own body, regardless of its condition and the assessment of others. A negative body image is manifested in a high criticality of one's own body, an untrue comparison of the real weight and state of the body with the vision of oneself. Self-assessment of this format, in turn, affects how an individual considers the value of their own body and their value as a person.

Researchers defined body image as a person's subjective experience of their body as a mental spatial image formed due to interpersonal interaction, that is, it includes not only a perceptual component but also social attitudes, the experience of interaction with other people; as a mental picture of the body with a component of the individual's affective reaction to it [11]. In the 90s of the 20th century, the study of the influence of culture on body image became relevant, since then Western society promoted slimness for women as a cultural ideal. It was identified that dissatisfaction with the body can manifest itself from the age of eight ("fear of fat"), and age, class, ethnic origin, and gender emphasised the factor of socio-cultural pressure on women's perception of themselves [12].

Analysing body image: Psychological approaches and concepts

In the early 2000s, people were greatly influenced by the media field, which idealised underweight women, which became a role model. That is why most studies have focused on the influence of media on the development of body image and the examination of eating behaviour. In particular, within the framework of the socio-cultural concept, it was investigated how people, comparing their appearance with the ideal created by society, or any other idealised person, face anxiety about their own body image, and it is the pressure of society on the individual through the ideal of appearance that is the main factor in disrupting the perception of body image [6].

The feminist approach also emphasises the importance of public pressure on the development of body image. Because of the social standards of flawless beauty, women begin to suffer from the objectification of their own bodies, which includes constant observation of their own bodies, the development of beliefs about control over them, the

development of labels and the interiorisation of beauty ideals. This creates a big problem because some women are so committed to the ideal, that they are even ready for extreme practices of changing their own bodies, which, admittedly, does not give the expected results due to the anatomical features of people and leads to frustration and negative body image [2].

N.L. Wood-Barcalow et al. note that body image is

linked to many factors, such as interpersonal relationships, social influence, spirituality and religion, biology and genetics, cultural values, society and media, and age-related changes (Fig. 1). Each of these factors of influence goes through a stage of information filtering; people with a positive body image perceive only part of the influence of these factors due to information filtering [13].

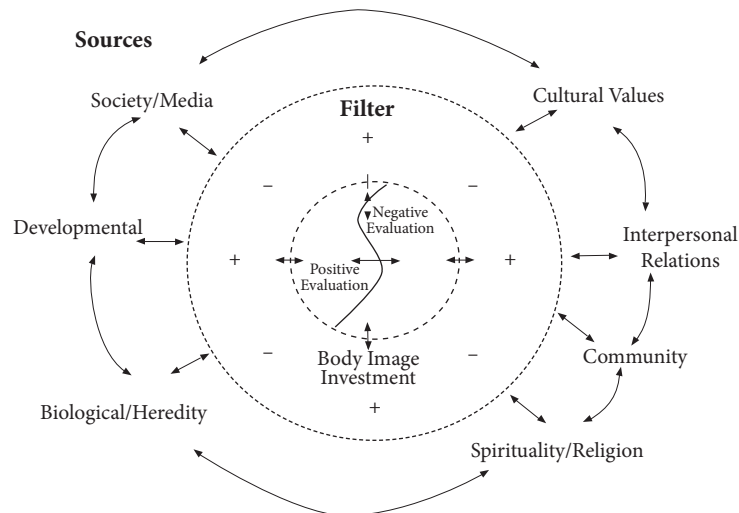


Figure 1. Body image model by N.L. Wood-Barcalow

Source: [13]

The cognitive behavioural concept of understanding body image is now one of the most substantial in the field of investigating physicality. This approach has become the leading one in this study since body image is defined as a multi-faceted construction that includes the perception of a person, their beliefs, thoughts, and feelings about their own appearance and how a person feels in their own body. A well-known representative of this approach, T.F. Cash, has created a toolkit that allows assessing a person's attitude to their own body, determining the scale of body image states, inventory strategies for overcoming body image, etc. According to the understanding of body image of T. Cash, this phenomenon can be divided into four categories:

1. Attitude to body image means how satisfied a person is with their own body and appearance.
2. Investing in body image refers to how much importance a person attaches to appearance when determining themselves and their own self-esteem.
3. The behavioural aspect is related to appearance and includes taking care of oneself, checking and hiding certain aspects of appearance, avoiding specific places, activities, or people.
4. Body image perception refers to how accurately a person evaluates their own body size and shape [14].

Body image is formed gradually, starting from childhood. It is influenced by both past and current experiences. The most common determinants of body image are cultural factors, interpersonal experiences, and physical changes. Factors that can enhance or maintain a sustained impact

on body image include internal dialogues, body image-related emotions, and self-regulating behaviour. Certain life situations, according to T. Cash, due to their context can activate information processing and evaluating judgments about own appearance [14].

Cognitive distortions in body image development

Cognitive distortions can be considered fundamental errors of thinking that interfere with the individual's ability to make realistic formulations and interpretations of the world, others, and themselves [15; 16]. These are irrational thoughts and beliefs that are unconsciously reinforced over time. These patterns of thinking are often subtle; it is difficult for a person to recognise them in their own thinking when they become a permanent feature of a person's everyday thoughts. This is why they can be so destructive, as it is difficult for a person to change what they do not notice in themselves and do not consider it a problem.

The concept of "cognitive distortions" is justified by A.T. Beck, who defined them as the result of information processing in ways that predictably lead to errors in thinking [15]. In the paper, A. Beck identified six cognitive distortions: selective abstraction, over-generalisation, exaggeration, and minimisation, personalisation, and absolutist, dichotomous thinking. Later, the understanding of cognitive distortions was expanded and supplemented by other researchers. In particular, additional cognitive distortions identified by the researchers include externalisation of self-esteem, comparison, and perfectionism [16; 17]. This

study examined the following cognitive distortions and their impact on body image:

1. Exaggerating the danger. Avoidance of unforeseen circumstances, avoidance of risks, responsibility, and competition; avoidant alertness and passivity, self-restraint and increased self-control with references to numerous or exaggerated dangers, unfavourable circumstances, and unfriendly attitude.

2. Catastrophisation, which reflects the tendency to "increase" the scale of minor undesirable or negative situations. The individual exaggerates the importance of problems and reacts vividly to them, as a rule, due to the direct contact of idealised ideas about themselves and others with reality. An acute, negatively exaggerated response to problems is expressed in an unrealistic expectation of a threat to life, health, well-being, and social status; loss of trust and confidence that someone will act dishonestly in relation to the individual; a tendency to affective-shock and dissocial reactions.

3. Forced liability Identification with social norms, perfectionism, the desire to protect oneself by carefully following social norms, unconditional and not always critical adherence to the rules, norms of behaviour and etiquette. Diligence and thoroughness, excessive politeness and caution in relationships, and a tendency to evaluative judgments that follow from social standards adopted in a particular group.

4. Mind reading. Confidence in the ability to read people's minds and the ability of others to do so. The tendency to "think" for other people, based on unfounded expectations and projections. One-sided, often negative judgments about other people's intentions, actions, and assessments. Tendency to insufficiently substantiated conclusions.

5. Personalisation. The tendency to take everything personally, the willingness to take personal responsibility for everything that happens. In the perception of other people and phenomena, the focus is on moral judgments and assessments. Declaration of increased moral responsibility, striving to ensure it.

6. Categoricalness. Persistent desire to defend self-esteem, associated with the fear of making mistakes, egocentric hierarchy, and narrowing of the problem field. The inflexibility of judgments, the predominance of self-centred defensive judgments, and inaction, the tendency to explicitly or covertly deny the opinions and assumptions of other people "by principles", identifying oneself with the subject of dispute.

7. Maximalism. Striving for the ideal in all areas, extreme assessments and judgments. The tendency to exaggerate their achievements and reproach others for not doing enough, devaluing others for laziness and irresponsibility. The futile expectation of admiration as a reward for hard work and perfection.

8. Trust in criticism. Any criticism is perceived as objective. A disapproving, negatively biased attitude towards oneself is expected. Any lack of unity of mind or remark is perceived as a reproach, disgust, or humiliation. Fixation on critical comments, insults, distrust, and wariness.

9. Comparison with others. Repeated evident depreciation of own capabilities, status, achievements, depreciation

of one's own "self", degrading of one's own abilities. Declaring weakness and helplessness as an excuse for failures and unwillingness to actively overcome life's difficulties. Learned helplessness, pessimistic attitudes, the desire to get rid of responsibility for life's failures, and the search for protection [16].

MATERIALS AND METHODS

The study used the Multidimensional Body-Self Relations Questionnaire-Appearance Scales – MBSRQ-AS and The Body Image States Scale – BISS, developed by T. Cash and under his guidance [18; 19]; a questionnaire of cognitive errors developed by A. Freeman and R. DeWolf [16]; Psychological mindedness by H.R. Conte [20]; questionnaire regarding socio-demographic data, body mass index of respondents, and their attitude to their own body.

Multidimensional Body-Self Relations Questionnaire-Appearance Scales – MBSRQ-AS [19] is a globally recognised research tool that implements a multidimensional approach to assessing attitudes to body image, considering various components – attitudes to appearance, physical fitness, and health, etc. The study used a variant of this questionnaire – MBRSQ-Appearance Scales (AS), which includes 34 survey elements, statements are evaluated on a scale from 1 to 5. The method includes 5 subscales:

1. Self-assessment of appearance – the scale shows the level of satisfaction or dissatisfaction with one's own appearance.

2. Orientation to appearance – characterises the degree of contribution to one's appearance (a high orientation to appearance means that the person attaches special importance and attention to it, a low one characterises indifference to one's own appearance).

3. Satisfaction with body parameters – the scale evaluates satisfaction with certain aspects of one's own body.

4. Concern for excess weight – demonstrates the level of alertness and fear of gaining weight.

5. Self-weight assessment – the scale determines how a person evaluates their weight, ranging from underweight to overweight.

Body image states scale (BISS) [18]) consists of six points and evaluates short-term affective/evaluative experiences related to one's own appearance. Points of the scale are aimed at evaluating such bodily experiences as: dissatisfaction/satisfaction with the appearance in general; dissatisfaction/satisfaction with the size and shape of the body; dissatisfaction/satisfaction with the weight; a sense of one's attractiveness/unattractiveness; feelings about one's appearance at the moment compared to feelings about the body usually, an assessment of one's appearance compared to the appearance of the "average" person.

Questionnaire of cognitive errors [16] includes 50 items. A cognitive distortion is understood as an exaggerated or irrational model of thinking that is fixed over time and affects the perception of information and behaviour of a person. The questionnaire measures the severity of the following scales: catastrophisation, mind reading, personalisation, self-confidence, trust in critics, maximalism,

comparison with others, exaggeration of danger, categoricalness, forced liability. Statements are evaluated on a scale of 1 to 4 points.

Psychological mindedness scale [20]. Psychological mindedness is the ability to introspect, reflect, understand own feelings, being open to new experiences. The questionnaire includes 45 statements, which are evaluated according to the degree of agreement of the respondent with them (completely disagree, disagree, agree, completely agree). It has 5 subscales:

1. Interest in the field of experiences – how important it is for a person to understand the deep reasons for their feelings and actions.

2. Accessibility of experiences – a person's understanding of what feelings they are experiencing and the ability to identify them.

3. The benefit of discussing experiences – how useful it is for a person to tell others about their feelings.

4. The desire and willingness to discuss experiences – the level to which a person is willing to discuss their own experiences with others.

5. Openness to new experiences – to what extent a person tends to have a positive attitude towards new experiences.

The questionnaire developed by the authors included questions about the socio-demographic data of the respondents, body mass index, and their attitude to their own bodies.

For the purpose of quantitative *data processing the following was applied*: primary descriptive statistics, Shapiro-Wilk distribution normality test, correlation analysis (Spearman's rank correlation coefficient), linear regression analysis, and Mann-Whitney *U*-criterion. Statistical analysis was conducted using the RStudio Integrated Development Environment.

Facebook Instagram, Telegram, Viber, social networks and instant messengers were used to collect the sample. The sample consisted of 69 women aged 18 to 23 years, mean age: 20.65 years, standard deviation: 1.161. The survey was anonymous and was conducted using a Google form. In the beginning, a short appeal to respondents was posted, explaining the purpose of the study, informing them about the voluntary involvement and confidentiality of the study, how to process and use the information (informed consent); after the respondents indicated their consent, they could start the examination. The questionnaire included mostly open-ended or multiple-choice questions; other

questionnaires were used according to standardised options, which combined statements and questions with multiple-choice answers (scales).

In the course of the empirical study, the following assumptions were tested: 1) the presence of cognitive distortions is a factor in the negative perception of adolescent girls of their own body image; 2) the perception of body image is positively associated with the level of interest in the field of experiences, accessibility of experiences, desire and willingness to discuss them, openness to new experiences and benefits from discussing experiences.

RESULTS AND DISCUSSION

Analysis of the survey data identified the following:

1. 78.3% of the girls surveyed would like to change something in their body. Therewith, 71% of the subjects have a body mass index (BMI) within the normal range: from 18.5 to 24.99; 21.7% have a BMI of less than 18.5; 7.3% have a BMI of over 25.

2. The most common options for the desired changes, which almost every girl wanted, were the desire to reduce their own weight and gain muscle mass. Less common, but frequent, were the desire to change their nose, enlarge lips, chest, and reduce the waist. Occasionally there were options, such as: remove cellulite, have long hair, increase or decrease the size of the hips, improve the quality of the skin, change the shape of the face.

3. 78.3% of young women believe that there are social standards of physical attractiveness. The respondents paid special attention to the following characteristics of physical attractiveness standards: a slim body, an hourglass figure (voluminous breasts, thin waist, voluminous hips), symmetrical facial features, straight white teeth, and clean skin.

4. 91.3% of women surveyed believe that they have physical advantages; simultaneously, 85.5% state that they have flaws and imperfections in their appearance.

Checking the data obtained by psychodiagnostic methods for the normality of the distribution according to the Shapiro-Wilk test showed that only 7 out of 25 scales have a normal distribution, so it was decided to use non-parametric methods of statistical data processing. The next stage of the analysis was to identify relationships between the investigated variables by creating a correlation matrix considering nonparametric correlations, using the Spearman correlation coefficient (Table 1).

Table 1. Correlations between indicators of self-perception and psychological mindedness

Method scales Appearance assessment		Multidimensional Body-Self Relations Questionnaire			
		Focus on appearance	Satisfaction with body parameters	Worrying about being overweight	
Psychological mindedness scale	Interest in the field of experience	0.23	0.36*	0.03	0.15
	Accessibility of experiences	0.15	0.01	0.13	-0.11
	Benefits of discussing experiences	0.33*	0.30*	0.10	0.10
	Desire and willingness to discuss experiences	0.11	-0.31*	0.16	-0.09
	Openness to new experiences	0.04	0.07	-0.08	0.21

Note: * - substantiality level $p \leq 0.05$

Table 1 shows that there is a moderate positive relationship between the orientation of the surveyed women to appearance and interest in the field of experiences ($r = 0.36$), the benefit of discussing experiences ($r = 0.30$), but the inverse relationship between orientation to appearance and willingness to discuss experiences ($r = -0.31$). The assessment of appearance is directly related to the benefits of discussing experiences ($r = 0.33$). However, the substantiality

of the connection is insufficient for further discussion of the hypothesis put forward about the relationship of interest in the field of experiences, accessibility to experiences, desire and willingness to discuss experiences, openness to new experiences, and benefits from discussing experiences with the attitude and perception of one's own body, which makes it necessary to test it on a larger sample. In addition, the correlations presented in Table 2 were obtained.

Table 2. Correlations of the investigated parameters with types of cognitive distortions (according to Spearman)

Cognitive distortions Interest in the field of experience		Indicators of psychological mindedness				
		Accessibility of experiences	Benefits of discussing experiences	Desire and willingness to discuss experiences	Openness to new experiences	
Cognitive errors questionnaire	Catastrophisation	0.12	-0.16	0.02	-0.35*	-0.06
	Mind reading	0.39*	0.03	0.33*	0.07	0.05
	Personalisation	0.08	-0.27*	0.06	-0.27*	-0.01
	Trust in criticism	-0.05	0.02	-0.07	-0.26*	-0.16
	Maximalism	0.07	-0.10	0.02	-0.16	-0.06
	Comparison with others	0.03	0.01	-0.05	-0.33*	-0.12
	Exaggeration of danger	0.18	-0.15	-0.02	-0.44*	-0.22
	Forced liability	0.31*	-0.12	0.09	-0.30*	-0.10
Categoricalness	-0.14	-0.12	0.08	-0.15	-0.02	

Note: * – substantiality level $p \leq 0.05$

As displayed in Table 2, moderate connections were identified between indicators of psychological mindedness and individual cognitive distortions. What attracts attention is that there is the closest relation ($p \leq 0.05$) between the desire and willingness to discuss one's own experiences and cognitive distortions, in particular, an inverse relationship with catastrophisation (-0.35), personalisation (-0.24), trust in criticism (-0.26), comparison with others (-0.33), exaggeration of danger (-0.44), forced liability (-0.30). Although these correlations are not strong, it can be assumed that it is a person's willingness to discuss, verbalise their own experiences, and therefore better understand them, that is the key factor that eliminates the severity of cognitive distortions. These results may be useful for future research on the cognitive field of young women, and for developing strategies for psychological assistance in an individual or group format.

On the other hand, some cognitive distortions were identified to be positively associated with certain indicators of psychological mindedness: mind reading with an interest in experience (0.39) and the benefits of discussing experiences (0.33); forced liability – with an interest in the field of

experiences (0.31). That is, the more pronounced is the cognitive distortion, which consists in assigning meaningless assumptions about other people's opinions (mind reading), and following social norms, striving for the ideal, the greater the interest in the field of experiences and the tendency of the person to think that discussing their own experiences is a useful activity. Most interesting in terms of developing therapeutic programmes is the relationship between the cognitive distortion of "catastrophisation" and the desire and willingness of subjects to discuss their experiences. According to the results, the higher the level of catastrophisation, the lower the openness to discussing emotions, thoughts, and experiences with other people.

In the future, the differences between the two samples of young women in terms of levels of cognitive distortion were evaluated. The first sample ($N = 15$) consisted of subjects who did not want any changes in their body and appearance, and the second sample ($N = 54$) included those young women who wanted changes in their body and appearance. The results of statistical calculations using the nonparametric Mann-Whitney U-test are presented in Table 3.

Table 3. Differences between groups of subjects who want to change their body and appearance and those who do not

Cognitive distortion	W	P-Value	Cognitive distortion	W	P-Value
Catastrophisation	580.5	0.01026	Maximalism	530.5	0.06688
Mind reading	529	0.06792	Comparison with others	518	0.09812
Personalisation	423.5	0.7918	Exaggeration of danger	435	0.6651
Trust in criticism	539	0.05038	Forced liability	476.5	0.2982
			Categoricalness	506	0.1389

According to the results presented in Table 3, a substantial difference between the two groups in the level of catastrophisation was identified ($p \leq 0.01$). This can be explained by the fact that with this cognitive distortion, a person tends to irrationally assess the situation as much worse than it really is. Therefore, a girl who has a high level of catastrophisation can hyperbolise her own physical flaws, which can cause an obsession with this issue, and provoke a negative development of thoughts, spreading dissatisfaction with the whole body. In addition, the selected samples differ substantially in the level of such cognitive distortion

as trust in criticism ($p \leq 0.05$). Thus, the group of young women who want to change their body and appearance and the group that does not, differ substantially in the severity of such cognitive distortions as catastrophisation and trust in criticism. Therefore, it can be argued that these types of cognitive distortions, based on hyperbolisation of one's own flaws and trust in criticism from others, are associated with a negative body image and its rejection.

Regression analysis confirmed the substantial impact of catastrophisation on the perception of body image by adolescent girls (Table 4).

Table 4. Regression model

Residuals:				
Min	1Q	Median	3Q	Max
-19.121	-3.874	0.126	5.044	15.044
Coefficients:				
	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	31.9691	3.2082	9.965	7.4e-15
catastrophisation	-0.9177	0.3249	-2.824	0.00624
Multiple R-squared	0.1064	p-value (R-squared):	0.006236	

The results demonstrate that of all the cognitive distortions, it is the level of catastrophisation that causes young women to be satisfied or dissatisfied with their bodies. According to the regression model, if the level of catastrophisation is changed by one, the average, namely its forecast, will be reduced by 0.9177. The R-square score is 0.1064. These data indicate that catastrophisation explains 10% of the result of satisfaction with one's own body; the substantiality level of $p \leq 0.01$ indicates that this factor is quite substantial and the detected pattern extends to the general population.

The results of the study correspond to the data obtained in modern psychological research and complement them. Thus, in one of the studies of body image, it was identified that adolescent girls are characterised by comparing their own appearance with people who, in their opinion, look better than them, which is moderately associated with a negative body image [21]. Young women most often compare their own appearance with the appearance of their peers and rarely compare it with the appearance of representatives of their families [22]. In social networks, young women, in particular, women with eating disorders, often represent idealised images of themselves [4; 6]. This unecological comparison of one's own appearance with that of others is akin to cognitive distortion. A substantial number of studies confirm that the body image of young women is negatively affected by viewing beautiful photos of other girls on social networks, which certainly indicates that a large number of them suffer from the depreciation of their own body and personality due to social irrational comparison of themselves with others [6; 23].

From the perspective of the influence of cognitive distortions on body image, researchers have determined that women who are prone to cognitive distortions associated with

the imaginary ideal of a slim body experience a fusion of thoughts and perception of their own body [24; 25]. In addition, it has been suggested that people with high levels of perfectionism in terms of appearance make large investments in the way they look, so they are more focused on appearance-related stimuli. Therefore, young women who invest heavily in their appearance may be particularly prone to negative cognitive distortions or vulnerable to negative assessment after social comparison with other attractive women. Those who have a negative body image have distorted and dysfunctional knowledge of their appearance, such as increased appearance defects and biased social comparison [3; 26].

Some studies also point to a substantial impact of catastrophisation as a cognitive distortion and its positive association with weight dissatisfaction, which is one of the components of a negative body image [27]. Thus, the conducted study complements and concretises the data on the impact of cognitive distortions on the body image of young women, in addition, it was performed on the Ukrainian sample, which opens the way to a comparative analysis of the body image of women-representatives of different countries and cultures, because, as noted, socio-cultural factors have a substantial impact on this phenomenon.

CONCLUSIONS

Theoretical analysis of the problem of body image of young women and factors of its development has shown the presence of a substantial number of approaches and paradigms. One of the most productive modern research approaches is cognitive-behavioural, in particular, the concept of T. Cash's body image understanding, formulated on its basis, which considers socio-cultural and psychological factors of body image development.

Among psychological factors, cognitive distortions are considered as irrational thoughts and beliefs, fundamental errors of thinking that interfere with the ability of a person to make realistic interpretations of the world, others, and themselves, and over time become a distorting filter for information. The influence of cognitive distortions on the body image of young women, indicators of psychological mindedness, which include interest in the field of experiences, availability of experiences, benefits from discussing experiences, desire and willingness to discuss experiences, and openness to new experiences, is analysed.

The survey showed that 78.3% of young women surveyed emphasise the existence of social standards and want to lose weight or change the natural shape of their body. This fact is especially substantial given the fact that 71% of the sample have a normal body weight, which does not require correction from the standpoint of health.

Through correlation analysis, weak or moderate connections of the scales of psychological mindedness – interest in the field of experiences, accessibility to experiences, desire and willingness to discuss them, openness to new experiences and benefits from discussing experiences – with the perception of one's own body were identified. The most connections were identified between the desire and willingness to discuss one's experiences and cognitive distortions; these are inverse connections with catastrophisation (-0.35), personalisation (-0.24), trust in criticism (-0.26), comparison with others (-0.33), exaggeration of danger (-0.44), forced liability (-0.30). Since all connections are reversed, it can be concluded that it is a person's willingness to discuss, verbalise their own experiences, and therefore better understand them, that is the key factor that

eliminates the severity of cognitive distortions. These results are of substantial practical importance for the development of strategies for psychological assistance to young women.

When comparing groups of young women depending on the desire or unwillingness to change their own bodies, substantial differences were identified between these groups in the severity of cognitive distortions such as catastrophisation ($p \leq 0.01$) and trust in criticism ($p \leq 0.05$). This indicates the destructive influence on the self-image of young women by their tendency to trust critical comments about their appearance and hyperbolise their flaws. The negative impact of catastrophisation on the perception of one's own body image was confirmed by regression analysis. Therewith, a moderate negative relationship was identified between catastrophisation and the desire and willingness to discuss their experiences, which can help in creating methods of psychological assistance for young women who are characterised by an irrational perception of their own body image.

The prospects for further research are to clarify the identified relationships in a larger sample of respondents, and a comparative analysis of cognitive distortions and their relationship to the body image of representatives of teenage and adolescent groups, which will allow identifying age dynamics, the most substantial factors of influence for these groups, and factors that retain or even increase their influence after the end of adolescence. The data obtained will be useful for the development of psychocorrective and psychotherapeutic programmes for girls and young women, which will help prevent the development of eating disorders in these groups of people.

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Тетяна Миколаївна Яблонська, Анастасія Ярославівна Каченюк

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Роль когнітивних викривлень у сприйнятті образу тіла молодих жінок

Анотація. Аналіз сучасних психологічних досліджень і практики психологічної допомоги свідчить про актуальність проблеми образу тіла, особливо для дівчат і молодих жінок. Водночас більшість наявних досліджень сфокусовані на вивченні образу тіла дівчат підліткового віку, що зумовлює необхідність уточнення предикторів образу тіла в інших вікових періодах. Мета статті – висвітлення результатів теоретико-емпіричного дослідження ролі когнітивних викривлень у сприйнятті образу тіла дівчат юнацького віку. Методологічною основою дослідження стали когнітивно-біхевіоральна концепція розуміння образу тіла Т. Кеша, трактування психологічної розумності Х. Конте, теорія когнітивних помилок А. Фрімана. Розглянуто роль різних факторів у сприйнятті образу тіла: 1) когнітивних викривлень як одного з предикторів нераціональної стратегії поведінки та мислення людини; 2) зацікавленості у власній особистості та розуміння власних переживань як чинника повноцінного прийняття себе. Використано Мультимодальний опитувальник ставлення до власного тіла та Шкалу станів образу тіла Т. Кеша, опитувальник когнітивних помилок А. Фрімана та Р. Девульфа, шкалу психологічної розумності Х. Конте, авторську анкету. Дослідження підтвердило вплив соціальних стереотипів на сприйняття образу власного тіла

молодих жінок. Зокрема виявлено, що значна кількість опитаних (78,3 %) підкреслюють існування суспільних стандартів і висловлюють бажання схуднути або змінити форму свого тіла. Установлено, що 71 % опитаних мають нормальну масу тіла, яка не потребує змін з погляду здоров'я. Кореляційний аналіз показав слабкі та помірні зв'язки між показниками психологічної розумності жінок та тим, як вони сприймають власне тіло. Порівняння груп досліджуваних жінок, які висловлювали бажання змінити власне тіло, із жінками, які не мали такого бажання, виявило значущі відмінності між цими групами в рівні вираженості когнітивних викривлень, як-от катастрофізація ($p \leq 0,01$) та довіра до критики ($p \leq 0,05$). Застосування регресійного аналізу підтвердило істотний вплив катастрофізації на те, як опитувані сприймають образ власного тіла. Виявлено також помірний зв'язок між катастрофізацією і бажанням та готовністю обговорювати власні переживання, що слід враховувати під час створення методів психологічної допомоги жінкам з ірраціональним сприйняттям образу власного тіла

Ключові слова: самооцінка зовнішності, психологічна розумність, помилки мислення, катастрофізація, довіра до критики, кореляційний аналіз

UDC 159.923

DOI: 10.52534/msu-pp.8(4).2022.43-51

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Value-Semantic Preconditions of Professional Success of the Individual: Gender Measure

Article's History:

Received: 07.09.2022

Revised: 03.12.2022

Accepted: 28.12.2022

Suggested Citation:

Aleksieva, A.V. (2022). Value-semantic preconditions of professional success of the individual: gender measure. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 43-51.

Abstract. The study is devoted to the examination of personal factors of professional success, namely the relationship between the components of social-communicative competence and value-semantic priorities of professional self-realisation, such as: professional status, social recognition, and creative self-realisation this is especially relevant in the context of creating the most favourable conditions for the professional development of young people. The purpose of the study is to identify gender features of social-communicative competence and identify how they affect objective and subjective measurements of professional success. The key research methods are a set of surveys, in particular, the author's questionnaire called "Success" and the method of G.V. Protasova, "Social-communicative competence". The results obtained demonstrate that for male representatives, the status measurement of professional success substantially correlates with the tolerance of the subjects to frustration, while in women this measurement of professional success is interrelated with the level of development of communicative competence. The study proposes that the desire for recognition as a measurement of professional success in male representatives is substantially interrelated with the orientation to success, and in female representatives, this measurement of success positively correlates with the tolerance of the subjects to frustration. It is proved that the desire for creative self-realisation as a measure of professional success correlates in male representatives with a high degree of personal autonomy, and in women – with high indicators of tolerance to uncertainty. The results of the study allow for determining the gender-specific features of psychological factors of professional success, namely, they represent the priority in this context for men of masculine, and for women of androgynous type of gender identity, which are certain coordinates for creating appropriate programmes for the development and actualisation of the potential of professional success of the individual

Keywords: success of professional self-realisation, social-communicative competence, gender identity, professional status, recognition, creative self-realisation

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INTRODUCTION

The study of the problems of professional success has recently become particularly relevant, which is due to the growing value of success in the modern world. The prestige of success in many areas of life emphasises the importance of developing the skills of behavioural strategies aimed at obtaining social approval from the reference environment, which is a confirmation of the success of the individual in the social environment.

In particular, an important component of success is professional success, which is a multidimensional

psychological phenomenon, the study of which has a certain theoretical and practical value. Questions about the development of professional success, determining the main personal prerequisites for success in professional self-realisation, etc. remain quite relevant. Therewith, the scientific aspects of investigating value-semantic priorities that determine the severity of certain measures of professional success and their personal factors and prerequisites are insufficiently investigated.

The outlined aspects of the development of this

subject determine the choice of a research subject dedicated to determining personal factors of professional success in the context of the expression of certain value priorities of professional activity of the subjects.

The issue of professional success is one of the most pressing issues of modern labour psychology, the study of which helps to identify the value-semantic aspects of professional success, and the influence of certain "models" of success on the development of successful career behaviour skills [1]. Thus, the phenomenon of professional success is appropriate to consider in the context of the professional self-realisation of the individual, which occurs due to the achievement of professional goals and the realisation of professional and personal potential in the process of professional activity [2].

Raising questions about personal factors of professional success, researchers associate professional development with such personal characteristics as extraversion and proactivity [3]. Comparative studies of psychological measures of professional success give grounds to assert the importance of such personal success factors as sociability, dynamism, managerial abilities, and the ability to work in a team and critically evaluate own capabilities, which creates favourable conditions for the realisation of professional and personal potential to the greatest extent [4].

Considerable attention in foreign papers was paid to the examination of motivational predictions of the professional success of the individual because it is the value-semantic aspects that substantially determine the priority measures and areas of professional self-realisation of the individual [5].

The differentiation of external and internal measures of professional success is reflected in the papers of Yu.O. Nazar [6], O.M. Kokun [2], in which the success of the professional activity is considered not only as the presence of substantial socially important results but also as the satisfaction of a specialist with the process and result of their own work.

Thus, professional success is a complex multicomponent formation, the examination of which concerns mainly the determination of personal factors and motivational preconditions of success in professional activity, and the allocation of its external and internal measures, which in their totality determine the success or failure of a specialist in the process of professional self-realisation.

The purpose of this study is to determine the relationship between the manifestations of social-communicative competence of an individual and their professional success and to clarify its gender-specific features.

LITERATURE REVIEW

Considering the concept of professional success, researchers, as a rule, distinguish objective and subjective success, namely, the main indicators of objective success include salary and career growth [7]. The main measurements of subjective professional success are the level of satisfaction of the subjects with their career achievements, which is associated with a

subjective assessment of the relevant professional results, which can be determined using special test methods [8; 9].

In particular, job satisfaction and self-efficacy, according to researchers, are important signs of successful employment and productive professional self-realisation of the individual [10]. Thus, subjective career success encompasses a person's satisfaction with their status growth, financial reward, and life satisfaction in general [11].

Researchers also highlight such aspects of subjects' interest in professional activities as cognitive, the manifestation of which is the desire to receive new information and knowledge, and the personal value of the acquired knowledge and pleasure in the process of learning new and unknown. Thus, interest in science is the interest of respondents in investigating new subjects from various fields of knowledge. The pleasure component contains positive emotions in the process of obtaining new knowledge, while the personal value of the scientific activity is represented through the importance of personal development in the scientific context and the importance of obtaining new knowledge [12].

The interpretation of professional success in measuring the career orientation of a person is relevant, which can also be considered as a certain value-semantic predicament that determines their career orientations [13]. Western researchers in the process of carrier growth investigation distinguish such factors as the ability to show flexibility and predictability in the process of professional development, and the intellectual resources of the individual, and its value system [14].

Researchers also highlight career orientation criteria such as results, personal time, and innovation opportunities. Namely, the respondents' desire to get high results characterises their desire to hold a leadership position, be famous, receive recognition from other people, and earn a lot of money. The importance of free time embodies the desire to have enough time for the family, therefore, to engage in work that allows integrating work and personal affairs into a certain lifestyle. The focus on innovation is manifested through the desire to create new products of activity and gain new knowledge and skills in the process of performing professional activities [12]. Modern research shows that the factors of satisfaction and orientation to innovation are important prerequisites that determine the individual's desire for career development and scientific activity.

Thus, the analysis of the career-building process concerns mainly the issue of career management [15-17], when employees themselves take the initiative and implement proactive career behaviour aimed at achieving certain career goals [18-20]. Thus, many researchers emphasise the importance of a proactive position in the process of building a successful career [15]. Namely, in their concept, researchers distinguish cognitive and behavioural components, in particular, the cognitive component covers forecasting and planning future careers, while the behavioural component consists of actions aimed at achieving certain career goals [21].

Other researchers distinguish reflexive, communicative, and behavioural career competencies [22]. Proactive

career reflection is aimed at investigating the values and ideas of career behaviour, therefore, it is an appropriate cognitive self-management in the process of building a successful career, a prerequisite for which is an understanding of own career priorities [23]. Behavioural career competencies cover certain behaviours aimed at achieving certain goals, which also implies the presence of appropriate communication competencies.

Thus, mainly researchers distinguish two aspects of career building, such as proactive reflection and proactive career building, namely, an example of career reflection can be the reflection of respondents about their capabilities and priorities in the context of further professional development, while the manifestation of proactive behaviour is an initiative aimed at implementing and presenting their professional achievements to the reference environment.

Active career building also requires the use of personal resources [24], which are an important prerequisite for the further career growth of a person [25]. Thus, a number of researchers emphasise the importance of resource potential in the context of career success and the ability to productively manage resources on the way to achieving priority career goals [7; 26; 27].

Considering the question of the relationship between resource potential and career success, people who are distinguished by a higher subjective assessment of their own professional success have a greater resource potential, the manifestation of which is a higher self-efficacy in the process of career growth [9; 28; 29]. The more pronounced the resource potential, the less there is a tendency to save resources and the more people are determined to further development, during which their resource capabilities will increase accordingly [30].

Therewith, less successful respondents will be more likely to strive to preserve the available resources, which will reduce their activity in the process of building their own career [24], and will feel less effective and focused on career development [9; 28].

Consequently, a positive assessment of the achieved level of professional self-realisation is accompanied by high self-efficacy and motivation to create and implement new career goals, which will contribute to further career growth [27]. A low career-level assessment usually correlates with a sense of lack of available resources and a corresponding decrease in career ambitions [31].

On the other hand, there is an opposite scientific position that proclaims the opinion that a low level of resource potential, on the contrary, will contribute to greater activity of the individual aimed at career growth [27]. Consequently, a low level of resource potential can, on the contrary, increase the activity of respondents in the context of obtaining additional resources for building a professional career [25; 30].

Therefore, resource opportunities are rather ambiguously related to career behaviour, namely, they can both stimulate and, conversely, reduce the focus and activity in career growth.

Thus, professional success is a complex and multidimensional formation that has both objective and subjective measures and assumes the presence of an appropriate resource potential. The conventional manifestation of professional success is career growth, which involves appropriate career behaviour and the presence of certain career competencies, in particular, proactive career reflection, which covers the definition of values and career priorities and appropriate cognitive self-management of the professional development process.

This study highlights such measures of professional success of the individual as status growth, namely obtaining a high professional status in society, recognition of professional achievements from the reference professional environment and creative professional self-realisation aimed at creating new original products of professional activity.

This scientific problem is characterised by the multidimensional nature of existing studies, which, simultaneously do not fully cover all possible vectors of its development. In particular, gender measures of professional success of the individual remain insufficiently defined, in particular, gender aspects of social-communicative competence, the manifestations of which are important factors for the success of professional self-realisation of the individual.

MATERIALS AND METHODS

The psychodiagnostic complex of research is formed by the author's questionnaire "Success", designed to determine the priority area of professional self-realisation of the individual, and the "Social-communicative competence" method of G.V. Protasova.

"Success" questionnaire (A.V. Alekseeva) allows determining the relevance of certain measures of professional success, namely, dominant values in professional activity, which form priority meanings of professional self-realisation and can be assigned to three categories: social and professional status, recognition, and creativity.

The questionnaire consists of 10 statements, the degree of agreement with which, respondents should evaluate on a 10-point scale.

1. For you, success is:
 - a) the popularity, citation, and value of your business products to other people;
 - b) pleasure to do what you love, joy from the result;
 - c) status in society, position, title, financial situation.
2. For you, a successful person is someone who:
 - a) devotes themselves to creative activities;
 - b) obeys the opinion of others to move up the career ladder;
 - c) creates things that are appreciated and enjoyed by other people.
3. You evaluate yourself:
 - a) considering the opinion of other people familiar with your activities;
 - b) based on the formal characteristics of your success (power, status, money, etc.);
 - c) based on your own intuitive sense of the value of your activities.

4. If the results of your activity are evaluated negatively, you will:

- a) try to meet the requirements of others;
- b) try to understand other people's thoughts and motivations;
- c) listen to your own feelings about what you are doing.

5. Negative reviews about your performance:

- a) negatively affect your self-esteem;
- b) cause a desire to immediately adjust your actions, so as not to cause certain sanctions from the public;
- c) do not deprive you of the pleasure that you feel from the process of your activity.

6. You evaluate other people's quality of life:

- a) based on how satisfied and happy they are in life;
- b) assessing their status in society;
- c) assessing the degree of their popularity.

7. To become successful in your field, you need to:

- a) track popular trends in the modern world;
- b) adhere to the opinion of reputable people;
- c) trust your intuition and spontaneous ideas and aspirations.

8. Success is:

- a) the ability to be happy and enjoy life;
- b) compliance with social norms and standards;
- c) the ability to be interesting to others.

9. A successful person is:

- a) a person who has reached a certain status level;
- b) a famous person;
- c) a person who has realised their talent.

10. If you could choose, what would you prefer:

- a) happiness and inspiration;
- b) power;
- c) recognition.

The questionnaire "Social-communicative competence" of G.V. Protasova, which consists of the following six scales: communicative competence, tolerance to uncertainty, autonomy, indifference to status growth, focus on success, and tolerance to frustration, was used to diagnose the social-communicative competence of the individual.

The scale of communicative competence allows for determining the ability to communicate productively with other people. High scores on this scale characterise a person as friendly, talkative, sincere, sympathetic, responsive, and flexible in communication, as one who communicates a lot with people, has many friends.

The uncertainty tolerance scale reflects the degree of tolerance to uncertain situations. High scores on this scale reflect the attitude to uncertainty as a challenge rather than a threat, therefore, respondents consider it a space for implementing creative tasks, the very process of solving which already brings pleasure.

The autonomy scale diagnoses the degree of independence of subjects from the opinions and views of others, their ability to express and defend their own position, despite possible objections from high-status and authoritative opponents.

The scale of indifference to status growth reflects a person's immersion in the present moment of life and lack of motivation for status growth.

The success orientation scale diagnoses the subjects' focus on obtaining substantial results from their activities, self-confidence, optimism, and the ability to effectively overcome difficulties on the way to achieving their goal.

The scale of tolerance to frustration reflects a person's ability to productive emotional self-regulation, which is an important predictor of the effective overcoming of problem situations.

The study sample consisted of students (second higher education) and masters of the Institute of Personnel Training of the State Employment Service of Ukraine in the speciality "management" and "psychology" and covered 128 people, including 82 female representatives and 46 men in the general age range from 22 to 53 years. One of the limitations of the research sample was that it did not include representatives of technical specialities. The study was conducted by testing students while studying in classrooms, namely the provision of answers to closed questions of tests and questionnaires by them. Respondents were identified by applying certain codes that allowed participants to determine their authorship.

The data obtained as a result of the study can be extrapolated to a similar sample of young people and middle-aged people receiving a second higher education.

Statistical data processing was performed using the SPSS programme (Pearson correlation coefficient).

RESULTS AND DISCUSSION

In the course of the research, as a result of applying the author's questionnaire, the priority area of professional self-realisation of the respondents was determined – status growth, the desire for recognition, or creative professional activity.

The desire for status career growth is manifested through the desire to get a high socio-professional status, namely through the motivation to achieve a high position, which gives a certain degree of freedom and power. Therefore, it is extremely important in this context that respondents are aware of the relevant personal qualities and characteristics necessary for successful professional growth, the external manifestation of which is compliance with the requirements and standards of the status professional environment.

For a person who seeks to recognise their own professional achievements on the part of society, the most important thing is not social status, but the receipt of weighty confirmation of their talent from society, and it is the professional success that becomes a goal in itself for them, accompanied by excessive dependence on it and high sensitivity to possible criticism. Thus, the desire to be recognised and acknowledged is characterised by an undeniable focus on success and excessive dependence on it, and in this context, success and recognition become the equivalent of a person's self-esteem and the main regulator of their activities.

When creative self-realisation becomes a priority measure of professional success, the main thing for a person is no longer the need to comply with someone's norms and standards and be popular and recognised in society, but the opportunity to experience a sense of happiness,

pleasure from the very process of their own activities, enjoy the results of their creativity, and be guided by their own feelings and considerations regarding the importance of the received creative products. Thus, the manifestation of creative professional orientation is the possibility of implementing own creative ideas, the prerequisite for which is an increase in risk propensity, and the perception of situations of uncertainty not as a threat, but as a challenge, which allows creating something new and unusual.

Thus, the main manifestation of the creative professional orientation of the individual is the search for the new, the ability to trust own intuition, combine incongruities and create new professional products, equating one's life with the experience of joy and pleasure from one's own professional creativity.

According to the results of the study, there are substantial correlations between the priority areas of professional success and the components of social-communicative competence. Namely, for male representatives, a negative correlation between status orientation and indifference to status growth is typical ($r = -0,65$; $p \leq 0,01$), and a positive relationship between status trends and the degree of tolerance to frustration ($r = 0,53$; $p \leq 0,01$) (Table 1). The more male representatives are capable of resilience to possible failures and negative influences from others, the more they are focused on achieving a high professional status. Admittedly, the ability to withstand possible defeats and failures, while maintaining a focus on success, is an important prerequisite for status success, which determines the extensiveness of this pattern in male representatives.

Table 1. Correlations between measurements of professional success and components of social-communicative competence among men

Social-communicative competence	Measurements of professional success		
	Status	Recognition	Creative self-realisation
Communicative competence	-0.01	-0.18	0.01
Tolerance to uncertainty	-0.01	0.01	-0.12
Autonomy	0.27	-0.21	0.39*
Indifference to status growth	-0.65**	-0.22	0.23
Success orientation	0.00	0.79**	0.06
Tolerance to frustration	0.53**	0.12	0.00

Notes: * – substantiality at the level of 0.05, ** – substantiality at the level of 0.01

For the women surveyed, the orientation towards obtaining a high professional status also positively correlates with the level of social-communicative competence, namely, the more women have productive communication strategies ($r = 0,64$; $p \leq 0,01$), the more pronounced is their focus on achieving a certain professional position in society (Table 2). This pattern is typical in the context of women's gender identity because it is the communication

skills that are an important predictor of the personal and professional success of female representatives, whose professional self-realisation is very strongly associated with the presence of productive professional contacts. Thus, the more women are determined to create productive professional relationships and capable of effective interaction with colleagues, the more they are aimed at achieving the appropriate status level in their professional activities.

Table 2. Correlations between measurements of professional success and components of social-communicative competence among women

Social-communicative competence	Measurements of professional success		
	Status	Recognition	Creative self-realisation
Communicative competence	0.64**	0.18	-0.17
Tolerance to uncertainty	-0.30	-0.00	0.38*
Autonomy	-0.10	-0.07	0.08
Indifference to status growth	-0.17	0.32*	0.25
Success orientation	0.42	-0.13	0.19
Tolerance to frustration	-0.18	0.53**	0.02

Notes: * – substantiality at the level of 0.05, ** – substantiality at the level of 0.01

The focus on recognition for male representatives is substantially related to their motivation to achieve success ($r = 0,79$; $p \leq 0,01$), namely, the more men prefer not to avoid failure, but to achieve substantial results, the more they

strive to get the recognition of others in the process of their own professional self-realisation. Namely, the desire to be successful and receive recognition of their professional achievements from the reference environment is accompanied by a

general orientation of the subjects to achieve success and the lack of expression of possible concerns about the likelihood of failure in the process of implementing professional tasks.

Therewith, for women, the focus on recognition of professional results, which correlates with indifference to status growth ($r = 0.32$; $p \leq 0.05$), is accompanied by a high degree of frustration tolerance ($r = 0.52$; $p \leq 0.01$), namely, the ability of female representatives to perceive possible failures neutrally gives them freedom from the need to be successful, which creates the most favourable opportunities for obtaining true recognition from others. Neutral perception of possible failures and negative attitudes on the part of society creates opportunities for realising the professional and personal potential of female representatives and receiving recognition from the reference environment. Consequently, a tolerant attitude to possible failures creates the best conditions for the maximum professional self-realisation of female representatives and their approval from the social environment.

Orientation to creative self-realisation also has certain differences between men and women in correlation with the manifestations of social-communicative competence. In males, creative self-realisation substantially correlates with the level of personal autonomy ($r = 0.39$; $p \leq 0.05$). The ability to be independent of standards and stereotypes causes men to activate creative abilities, which leads to the emergence of original products of activity. The willingness not to meet certain norms and violate certain rules and requirements are important factors in the realisation of professional abilities in male representatives.

Women have slightly different correlations between their attitude to professional self-realisation and the manifestations of social-communicative competence. A correlation between tolerance to uncertainty and women's attitude to creative professional self-realisation is diagnosed ($r = 0.38$; $p \leq 0.05$). It is the willingness to accept uncertainty and feel comfortable in uncertain conditions that activate the creative abilities of the female students, which as a result leads to the emergence of original products of activity. The ability of women to be tolerant of uncertain situations and feel comfortable in them is an important prerequisite for creative activity, which will result in the emergence of new original professional products.

Thus, different measures of professional success have substantial correlations with the components of social-communicative competence, the specific features of which are formed by the corresponding gender differences.

In men, there is a substantial correlation between status measurements of professional success and tolerance to frustration, namely, the ability to show resistance to possible failures and defeats correlates with the priority orientation of men to achieve high professional status. For women, the orientation to status growth is interrelated with the ability to communicate productively with others, because it is due to the developed communication skills that female representatives most often achieve high-status positions in the professional environment.

The priority for men for the recognition of their professional achievements in the social environment is interrelated with their focus on success, combined with a low tendency to avoid failure, resulting in high professional results approved by the social environment. For female representatives, the focus on professional recognition is accompanied by a higher degree of tolerance for frustration, namely, the ability to perceive possible failures neutrally and feel free from the need to be successful creates the best conditions for obtaining recognition from the reference professional environment.

The desire for creative self-realisation in the process of professional activity is accompanied by the highest degree of personal autonomy among male representatives, therefore, the willingness not to comply with established norms and violate rules and stereotypes creates a wider range of realisation of creative potential and its implementation in new original products of activity for them. In female representatives, the determination to the creative self-realisation is accompanied by a more developed tolerance to uncertainty, namely, the ability to feel comfortable in uncertain conditions contributes to the activation of women's creative abilities, which as a result leads to the emergence of original products of their creativity.

Thus, for men, in the context of their professional success, tolerance to frustration and focus on success are of particular importance, which ensures both the achievement of appropriate status positions and recognition from the reference professional environment. Namely, the ability to achieve and strive for success, despite possible difficulties and failures, creates the most favourable conditions for male representatives to obtain high professional results. In turn, a high level of psychological autonomy provides them with the opportunity to realise their creative abilities and create original products of professional creativity.

In the context of the status growth of female representatives, their communication skills are of particular importance, namely, the ability to properly build relationships with the professional environment is an important prerequisite for career growth and finding appropriate opportunities for professional development. Thus, using professional connections to find promising areas of career development, female representatives create conditions for building a successful vertical professional career and achieving the desired goals.

Tolerance to frustration ensures the independence of women from the opinions of others, therefore, from the need to receive recognition from reference others, which as a result contributes to the emergence of respect from respectable professional society. Tolerance to uncertainty ensures the ability of women to professional creativity because it is the ability to act productively in uncertain conditions that is one of the important prerequisites for creative activity, the result of which is the creation of original creative products.

Therefore, it can be concluded that the psychological prerequisites for professional success in men and women have distinct gender differences, which is due to the specific features of the development of male and female gender identity.

A number of scientific studies are devoted to the examination of the features of professional self-realisation and professional success of men and women, which allow determining gender differences in the level of job satisfaction, in particular, women show higher satisfaction with their professional activities when compared with men, especially in the case of the possibility of remote organisation of the work process [32], and the recognition of their professional achievements from society is also more important for them [33].

Therewith, these papers disregard the definition of gender factors of subjective and objective measurements of professional success, which requires further empirical research.

Thus, different measures of professional self-realisation, namely the focus on status growth, recognition of others, or creative self-realisation in the process of professional activity have substantial correlations with the components of social-communicative competence, which, in turn, differ in certain specific features in the context of the gender of the subjects.

CONCLUSIONS

Professional success is a complex personal formation that has certain motivational preconditions, value-semantic aspects, and personal factors that generally determine the priority measures and areas of professional self-realisation.

In this context, it is important to determine the external and internal measures of professional success, namely, the main objective indicators of professional success include such as wages and high socio-professional status obtained as a result of career growth. Subjective professional success is measured through the satisfaction of the subject of professional activity with their work and the corresponding assessment of their professional results.

The conventional measurement of professional success is the career growth of the individual, in particular, most researchers distinguish the following aspects of career building: proactive reflection and proactive behaviour. Proactive reflection is aimed at thinking about and determining possible coordinates and priorities for further professional development, while the main goal of proactive behaviour is to implement a specific set of actions aimed at achieving certain goals and results. Thus, a proactive career position covers a certain set of cognitive, communicative, and behavioural competencies, which together provide career opportunities.

An interesting section is the question of the resource potential of professional success, namely, career behaviour becomes most effective in a situation of having a high level of professional resources, when, highly subjectively evaluating their professional achievements, the individual is determined to further professional development and increasing their resource capabilities.

The low level of resources is quite ambiguously related to career activity: it reduces the motivation of the

individual to build a career, and, conversely, increases activity aimed at career growth and obtaining additional career resources. That is, the level of resource potential can quite ambivalently influence the career behaviour of respondents, namely, both stimulate and, conversely, limit their focus on career growth.

Therefore, professional success is a multicomponent formation that has both subjective and objective measures and assumes the presence of certain resource potential and appropriate career competencies, which include both reflexive abilities to determine possible values and priorities of career growth, which as a result provides cognitive self-management of the process of professional development and proactive behaviour aimed at realising career goals and obtaining appropriate professional results.

According to the results of the study, there are substantial correlations between the measurements of professional success and the components of social-communicative competence, the specific features of which have distinct gender differences.

Thus, in the context of women's professional self-realisation, the presence of communicative abilities, and tolerance to uncertainty and frustration, which are manifestations of both psychological femininity, which provides the ability to communicate productively and accept uncertain living conditions, and implies the development of masculine properties that determine women's resistance to negative influences, possible failures and defeats, is of particular importance. The professional success of female representatives implies the presence of an androgynous type of gender identity.

The professional success of men is interlinked with the level of personal autonomy, orientation to success, and the degree of tolerance to frustrating influences, which in their totality are vivid manifestations of psychological masculinity, the actualisation of which is an important prerequisite for the realisation of professional and personal potential. Thus, for men, in contrast to women, the dominant role in the process of their professional self-realisation is played by the masculine components of their gender identity, which must be considered in the process of creating programmes to improve and develop the professional success of the individual.

Professional success is a complex multidimensional personal formation, the psychological factors of which differ in a certain gender specificity, namely, different measures of social-communicative competence have very distinct correlations with the priority areas of professional self-realisation of men and women, which should be considered in the process of creating programmes for the development of personal prerequisites for professional success.

Promising areas of research on the raised scientific issues are the study of the relationship between the masculine/feminine components of a person's gender identity and the priority areas of their professional success.

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Ціннісно-сміслові предиспозиції професійної успішності особистості: гендерний вимір

Анотація. Статтю присвячено дослідженню особистісних чинників професійної успішності, а саме взаємозв'язку між компонентами соціально-комунікативної компетентності та ціннісно-смісловими пріоритетами професійної самореалізації, як-от: професійний статус, соціальне визнання та творча самореалізація, що є особливо актуальним у контексті створення найбільш сприятливих умов для професійного розвитку молоді. Мета роботи – визначити гендерні особливості соціально-комунікативної компетентності та з'ясувати, як вони впливають на об'єктивні й суб'єктивні виміри професійної успішності. Ключові методи дослідження – комплекс опитувань, зокрема авторська анкета під назвою «Успіх» та методика Г. В. Протасової «Соціально-комунікативна компетентність». Отримані результати демонструють, що для представників чоловічої статі статусний вимір професійної успішності значущо корелює з толерантністю досліджуваних до фрустрації, тоді як у жінок цей вимір професійної успішності взаємопов'язаний з рівнем розвитку комунікативної компетентності. У статті висунувано, що прагнення до визнання як вимір професійної успішності в представників чоловічої статі значущо взаємопов'язане з орієнтацією на успіх, а у представниць жіночої статі цей вимір успішності позитивно корелює з толерантністю досліджуваних до фрустрації. Доведено, що прагнення до творчої самореалізації як вимір професійної успішності співвідноситься в представників чоловічої статі з високим ступенем особистісної автономності, а в жінок – з високими показниками толерантності до невизначеності. Результати дослідження дають змогу визначити гендерну специфіку психологічних чинників професійної успішності, а саме презентують пріоритетність у цьому контексті для чоловіків маскулінного, а для жінок андрогінного типу гендерної ідентичності, які є певними координатами для створення відповідних програм розвитку та актуалізації потенціалу професійної успішності особистості

Ключові слова: успішність професійної самореалізації, соціально-комунікативна компетентність, гендерна ідентичність, професійний статус, визнання, творча самореалізація

UDC 373.2

DOI: 10.52534/msu-pp.8(4).2022.52-58

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Modern Approaches to the Professional Development of Preschool Education Teachers on Inclusive Education of Preschool Children

Article's History:

Received: 23.08.2022

Revised: 27.11.2022

Accepted: 28.12.2022

Suggested Citation:

Goncharenko, A.M., Diatlenko, N.M., & Melenets, L.I. (2022). Modern approaches to the professional development of preschool education teachers on inclusive education of preschool children. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 52-58.

Abstract. The relevance of the study is due to the fact that to ensure a high-quality educational process in a preschool institution, it is necessary to prepare educators to work in inclusive groups, that is, to equip them with knowledge and skills to teach and educate children with special educational needs. The purpose of the study is to analyse modern approaches to improving the qualifications of teachers of preschool education institutions on the problem of inclusive education of children and find effective ways of professional development of teachers on this issue in the conditions of the Institute of postgraduate education. The methodological basis of the study was the papers of Ukrainian and foreign specialists in the field of inclusive education. General theoretical methods are used to solve these problems: analysis, induction, deduction, comparison, generalisation of information from theoretical sources, and the typological method. The necessity of implementing a system of approaches to the professional development of preschool education teachers on inclusive education issues is substantiated. The results of a survey of teachers of preschool education institutions in Kyiv, according to which, it was established that the vast majority of participants need special training on the problems of inclusive education and consider the institute of postgraduate education as a place for such training. Effective approaches to improving the skills of educators are identified, in particular, the use of active methods in teaching and the inclusion of practical classes in the educational process based on inclusive institutions. Among the most popular subjects for professional development are the following: organisation of the educational process, cooperation with an assistant, development of didactic equipment, cooperation with parents, psychological support for the teacher. The practical importance of the research consists in informing teaching teams of postgraduate education about the specific features of the needs of preschool teachers in the field of advanced training on inclusive education. This problem is of interest to students, who receive a pedagogical speciality

Keywords: pedagogical innovations, professional development, pedagogical speciality, competence approach, children of preschool age, children with special educational needs

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INTRODUCTION

The number of children with special educational needs increases every year in Ukraine. In the modern world, access to quality education is a necessary condition for the development of a person and their ability to build their life autonomously and consciously. The Law of Ukraine "On Preschool Education" states that preschool age is an important period of development for each individual, so the goal of preschool education is not only the accumulation of a certain amount of knowledge but also the development of basic personal skills in children for the full development in the future [1].

One of the key problems of modern education in Ukraine is the development of new methods of teaching children with special educational needs and the training of special teaching staff. The quality of preschool education is directly determined by the professional readiness of the teaching staff. It is important to understand that in the modern context of innovations in education, new requirements are put forward for the professional and pedagogical skills of the teacher and the level of their professional knowledge, a new pedagogical position is gradually being formed, and

professional development is taking place. Now there is a need for a creative and qualified educator who will be able to develop a modern education system, will be able to integrate personal skills into the development of children with special educational needs.

Modern educational reforms put forward new requirements for all teachers of preschool education institutions. The main task at the present stage is to improve the professional level of educators for successful work in an institution that meets the needs of modern life. The issue of training highly qualified, creative, socially active, and competitive educators who are able to create a developing environment for each child, including for a child with special educational needs, is acute. Therefore, improving the professionalism of teachers and educators is one of the priority areas of modern education.

T. Shestakevych, V. Pasichnyk, and N. Kunanets believe that now Ukraine is opening up new prospects for the development of the education system, which are mainly associated with a new approach to raising children with special needs. The task is to transform preschool education institutions into institutions with large-scale educational spaces that encourage and support not only children with special educational needs but also employees of such institutions [2]. Therewith, a group of researchers led by A. Trofimov considers an important thesis about the possibility of cooperation of preschool institutions with various partners to improve the educational and social environment [3].

In the context of inclusive education in Ukraine, differences between children are seen as resources that contribute to the educational process, and not as obstacles to overcoming. J.P. Bentley et al. cite the main areas of work on creating an inclusive educational environment: the development of the culture of organising an educational institution; the implementation of an inclusive education policy; the introduction of innovative practices in teaching children. Therefore, the strategy for the development of inclusion in preschool education is not only a set of certain proposals for further actions and initiatives for children with special educational needs but also a tool for positive changes in kindergartens in terms of inclusive values [4].

Researchers P. Gäreskog and G. Lindqvist believes that since preschool education is the first integral stage of national education, the rationalisation of the system of professional qualifications of teachers becomes a socially substantial pedagogical problem, and the process of innovation in this system is a means of developing new goals [5].

The purpose of this study is a theoretical examination of approaches to the professional development of preschool education teachers on inclusive education of children in the system of postgraduate education. The scientific originality of the paper lies in the investigation of approaches to training teachers in the context of inclusivity on the example of a higher educational institution in the capital.

The following tasks were set to achieve the greatest effectiveness in the framework of the study: to clarify the essence of the concept of “inclusive education”; highlight

modern approaches to improving the skills of teachers of the preschool institutions; focus primarily on the professional development of teachers working in inclusive groups; identify the effective conditions for the professional development of teachers on this issue in the conditions of the institute of postgraduate education; justify the need to implement a system of approaches to improving the skills of teachers of preschool education institutions.

MATERIALS AND METHODS

The study of the problem of advanced training of preschool education teachers on inclusive education of preschool children was based on a number of methodological approaches, principles, and rules. The scientific principles of integrity, consistency, and objectivity in covering scientific facts and interpreting them were considered. Through theoretical methods – analysis, synthesis, generalisation, induction, and deduction – the content of research work on the readiness of educators to work in inclusive groups is identified, modern approaches to the problem of preparing educators for such work are clarified, effective methods and techniques that should be used in working with students at advanced training courses are highlighted. The generalisation method allowed for drawing brief episodic totals and general conclusions. Using the analysis method, the scientific literature was analysed, which allowed identifying the main approaches that contribute to improving the skills of educators in inclusive education.

The typological method helped to classify forms and methods of advanced training in the conditions of the institute of postgraduate education, satisfying the interest of teachers of preschool education institutions, including training seminars, supervision, coaching, self-design method, and adaptive pedagogical design.

The method of deduction has contributed to the systematisation of modern approaches to improve the skills of preschool education teachers in inclusive education of preschool children based on the analysed literature. Using the induction method, the forms of work for the professional development of preschool education teachers on inclusive education issues are highlighted.

A survey was conducted of 80 teachers of preschool education institutions aged 25 to 50 years to collect the necessary information. Among the survey participants were 71 women and 9 men. The study was geographically limited, as the only place to conduct the survey was the city of Kyiv.

RESULTS AND DISCUSSION

The modern globalised information society sets new requirements for all areas of humanitarian activity, in particular, for education. An important issue that needs to be addressed today is the education, socialisation, and personal development of children with special educational needs. In this complex process, the problem of training educators in an inclusive education environment is of particular importance. Inclusive education in America and Europe has a longer practice of implementation, it is considered much

broader, in particular, as an opportunity to attract children with special educational needs to the educational and national space. Inclusive education in Ukraine needs to be improved at the normative, social, and economic levels of development, success largely depends on the level of training of the teacher, educator.

Inclusive education in the modern sense appeared only at the end of the 20th century. The results of the analysis of the current state of inclusive education of preschool children identified the following contradictions: between the modern requirements of society in an effective and inclusive education system and the insufficient development of its theoretical and methodological base, the lack of proper scientific and methodological support; between the importance of social development of a preschool child in the education system and the lack of adequate means of organising this process; between the importance of training qualified specialists to support children with special educational needs and their families and the discrepancy between the content, forms, and methods of such training.

Considering the above, the task is to develop and create conditions for improving the skills of preschool teachers in the field of inclusive education of preschool children. Educators, psychologists, and speech therapists need to master pedagogical practices and technologies on various issues of organising inclusive education because no matter what reforms are conducted in the education system, they are somehow connected with a specific person, that is, the teacher [6]. In this regard, the issue of ensuring proper professional training of teaching staff and creating favourable conditions in the field of education of children with special educational needs arises.

The current education reform puts forward new requirements for the profession of preschool teachers on inclusive education issues. One of the tasks of recent years has been to substantially expand the zone of inclusive education, and against this background, the problem of preparing preschool teachers to work with children in inclusive groups has emerged.

The teacher should think freely and actively, predict the results of their activities, and model the learning process. The main task in the development of competencies at this stage is to improve the skills of preschool teachers in inclusive education that meets the requirements of modern life. There is a growing demand for highly qualified, creative, socially active, and competitive educators who can raise a socialised child in the modern world. Recent studies show that to improve the skills of preschool teachers in inclusive education, it is necessary to find new modern approaches to updating the content, forms, and methods of teaching. The main approach is called practice-oriented learning, which acts as a link between theory and practice, an effective way to enrich and develop the necessary professional skills of preschool education teachers. Among the important principles of organising advanced training of teachers of preschool education institutions are the following: orientation to the subjective professional requirements

of the teacher; considering the existing level of training of the specialist and the needs that arise as a result [7].

Today creating a single educational space, within which opportunities are formed for the continuous development of professionalism and compliance with basic principles is relevant, namely: a variety of services, forms, and levels of professional development; an individual approach considering the requirements, needs, and opportunities; the desired forms, methods, and content of training; openness and accessibility, which gives freedom to choose an individual option for professional development [8; 9].

Among the various modern approaches to the development of qualifications of teachers of preschool education institutions, it is worth highlighting the competence approach, since it most meets the expectations of society regarding the system of professional development of teachers [10-12]. The analysis of scientific literature allowed identifying the main approaches to the problem of developing the professionalism of preschool education teachers. The first approach is presented as a continuous scientific and methodological support for the professional development of teaching staff through meeting educational needs with a focus on professional experience, the degree of professionalism and individual requests.

This option of improving the skills of preschool education teachers on inclusive education issues may consist of the following forms of work [13]:

1. A system of regular seminars on relevant educational and pedagogical needs, held personally once or twice a month at methodological meetings.
2. A system of seminars for educators organised based on investigating educational needs and difficulties in preschool education institutions.
3. Individual consultations for educators.
4. Association of educators in temporary creative groups to solve relevant pedagogical problems. Such activity of teachers will help them focus on self-development as professionals.
5. Organisation of direct practice for educators based on reference methodological platforms for mastering the best pedagogical experience.
6. Consultation on inclusive education issues at the request of educators and other teachers of preschool institutions.

The second approach to the professional development of preschool teachers on the issues of inclusive education of preschool children can be presented through on-the-job professional development courses. This option is designed to meet the needs of educators with an emphasis on obtaining a state certificate of advanced training and can be conducted in educational institutions licensed to provide educational services.

These options for professional development solve the main problem – the absence of an employee at the workplace. The need to create a flexible system for advanced training courses for preschool teachers requires the development of various options for organising courses: in the morning or afternoon, depending on the shift of the teacher; once a week on a normal day for several months; during

holidays; weekends [14]. This variability allows teachers of preschool institutions not only to choose a convenient way of working but also the opportunity to simultaneously take part in several courses of interest to them without giving up their own professional activities.

The third approach to organising advanced training of preschool teachers is to meet the special educational needs of leading researchers on inclusion issues. These can include lectures-webinars, distance learning of the course, direct meetings and personal consultations.

The most popular form of professional development in Ukraine is often called advanced training courses in postgraduate education institutes. The advantage of this form is that it is completely free for teachers, the possibility of direct meetings with researchers, and allocating special time for learning in the classroom. The events of recent years have shown the high mobility of such institutions, in particular, the possibility of distance learning on various

electronic platforms. Modern papers show that there are various options for improving the skills of teachers in inclusive education; among the main principles – orientation to the individual needs of teachers, the practice-oriented nature of training, and variability in the forms and methods of teaching.

After analysing the approaches that contribute to improving the skills of educators in inclusive education, it can be concluded that the psychological readiness of a teacher is the most important component of effective education for children with special needs. Psychological readiness includes several factors: emotional acceptance of children with mental development disorders, motivational attitudes, moral foundations, perception of the “other”, personal readiness embodied in personal attitudes toward the child, and internal determination of the activity of the teacher’s personality [15].

The results of a survey conducted among the Kyiv preschool teachers are presented below (Fig. 1).

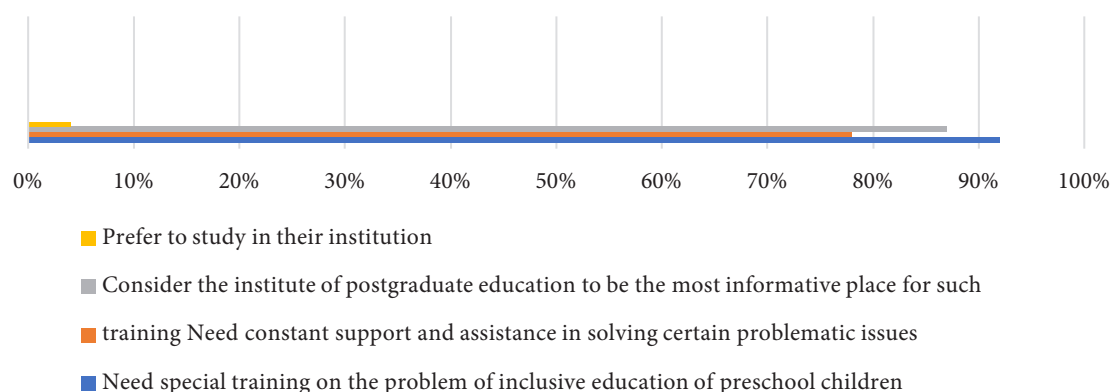


Figure 1. Results of a survey of teachers of preschool education institutions in Kyiv regarding inclusive education of preschool children, the number of respondents, %

The results of the survey showed that 92% of respondents need special training on the problem of inclusive education of preschool children; 78% – constant support and assistance in solving certain problematic issues; 87% consider the institute of postgraduate education to be the most informative place for such training; 4% prefer to study in their institution. The majority of teachers (81%) are inclined to use active methods in teaching and include practical classes based on inclusive institutions in the educational process.

The survey allowed concluding that, in general, teachers’ understanding of the essence of the concept of “inclusive education” is consistent with modern scientific understanding, but simultaneously, basic knowledge, theoretical training, and practical experience in this field are insufficient. In the conditions of modern education, the professional development of educators is a necessary component of the process of self-improvement and self-development, the development of professional patriotism and competence.

Among other things, respondents’ opinions differ on the contribution of various institutions to the professional development of educators. Every second teacher puts the

institute of postgraduate education in first place in terms of the importance of such contributions.

District methodological associations, heads of preschool education institutions, methodologists, and psychologists are more focused on the needs of teachers of groups of the general development of children, as evidenced by every second respondent. The quality of training and its effectiveness is one of the most pressing issues of modern training in Ukraine. Notably, according to modern Ukrainian teachers and international experts [16-18] on the development of inclusive preschool education, Ukraine has made substantial progress during the past few years. The main role in ensuring the effectiveness of the educational process of preschool education institutions on inclusion issues is played by the teacher and their professionalism. Therefore, the professional development of teachers of preschool education institutions is a priority of educational work that contributes to the professional development of teachers on inclusion issues and activates their creativity.

According to the results of recent studies, about half of the surveyed teachers of Kyiv preschool institutions (46.26%)

have a positive attitude to the education of preschool children in inclusive groups; 41.32% prefer to limit the education of such children to special institutions or special groups of general development ones [19]. Interactive forms of learning are becoming widespread, where teachers are involved in creative activities, dialogues that involve a free exchange of opinions, reasoned conclusions, and the search for ways to solve simulated situations. This approach contributes to the development of creative thinking and the selection of effective non-standard ways out of problem situations when working with preschoolers [20].

Modern researchers [21] define the following pedagogical conditions for successful skill development in the process of advanced training of preschool education teachers: the use of interrelated teaching methods that enable the creation of a holistic structure of professional activity of teachers in the context of inclusive education; a combination of methods of active improvement, training and reproduction of the social context for future work; the use of the potential of subject materials to create positive incentives for inclusive education.

The process of professional development of preschool education teachers is a complex creative process that involves familiarisation with non-conventional technologies of modern education and upbringing of preschool children with special educational needs, the specific features of partnership with parents, and modern approaches to the development and registration of pedagogical documentation [22]. Among the various forms and methods of professional development in the context of the institute of postgraduate education, ones that satisfy the interest of teachers of preschool education institutions are highlighted below:

1. Training seminars. This form is productive if the main focus is not so much on improving the theoretical level, but on practical mastery of inclusive learning technologies. The participants are offered tasks in advance that provide an understanding of the main characteristics of children with special educational needs and the specific features of pedagogical work with them.

2. Training as an effective way to organise the process of adult education in the system of advanced training of teachers. This method contributes to the actualisation of subjectivity and self-knowledge of the individual. A personality-oriented approach, interactive mode, a small number of participants in the group, and a scientific basis are the most important characteristics of training that improve the effectiveness of the learning process. An important component is the search for effective ways of acting in practical situations. Specialists raise the level of knowledge and skills in accordance with changes taking place in education [23].

3. Supervision in the adult education system involves solving professional problems that arise in working with people by discussing a particular problem with a knowledgeable colleague or mentor – a supervisor. Pedagogical supervision is considered as a process of equality in the dialogue, the relationship between the supervisor and the person undergoing supervision. The purpose of supervision is to increase

the level of professional competence through the discussion of professional problems, searching for practical solutions, identifying possible risks, and accepting the final result.

4. Coaching is a productive and rational method that is widely practised in the postgraduate education system. This innovative approach allows changing ordinary learning into an interesting, creative process, identifying the creative activity of the person who is studying. There are many methods of full-cycle coaching as an innovative technology for forming teachers' readiness to work with children who have special educational problems.

5. The method of self-design involves the development of professionalism of a specialist as a process of working on one's own personality, acquiring certain qualities, or getting rid of undesirable ones, and consciously transforming oneself. Self-design is an effective means of professional development for the teacher, which performs the functions of self-regulation, socialisation, optimisation, and self-actualisation in this process. This is active professional self-improvement, the realisation of creative potential, and productive executive-pedagogical reflection.

6. Adaptive-pedagogical design is a tendency to subordinate professional work to external circumstances by performing algorithms for solving problems, rules, and norms.

All of the above approaches are effective methods of improving the skills of educators in inclusive education, which will help to better unlock the potential of the teachers and better implement the educational process.

CONCLUSIONS

Theoretical analysis of the literature considered on the readiness of teachers for the inclusive education of preschool children shows that today inclusive education of preschool children is understood as an innovative process, and therefore requires special professional retraining from modern teachers. Professional development of teachers of preschool education institutions is a priority of institutes of postgraduate education and an important part of continuing education of teachers, as it contributes to the development of personality and activation of creative abilities of educators, the development of highly qualified specialists.

The study analyses modern approaches to the professional development of educators as an attempt to respond to the modern needs of preschool education institutions of Ukraine in qualified educators on inclusive preschool education as the main force of education in modern society. The authors believe that modern approaches to improving the skills of preschool teachers do not deny conventional methods and approaches, but rather identify and develop them in new variations. It should also be noted that there are positive features in the optimal combination of all these approaches to improving the skills of preschool teachers who have identical or similar characteristics.

All modern approaches to improving the skills of teachers of preschool institutions on the issues of inclusive education of preschool children ensure the self-realisation of the creative and professional potential of the teacher, the

acquisition of competitiveness and mobility in the modern educational space; high quality and efficiency of the teacher's activities; the ability to set goals and solve problems in the conditions of inclusive education in preschool institutions.

A well-built and developed system of interactive forms and approaches to improving the skills of preschool education teachers in inclusive preschool education will

lead to an increase in the quality of educational work in the context of inclusive education and unite the collective of educators. In the future, studies of inclusive education programmes for preschool institutions located in provincial areas of the country can be effective, considering the specific features of training personnel and providing children with the necessary equipment.

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Сучасні підходи до підвищення кваліфікації вихователів закладів дошкільної освіти з питань інклюзивного навчання дошкільників

Анотація. Актуальність дослідження зумовлено тим, що для забезпечення якісного освітнього процесу в закладі дошкільної освіти необхідно підготувати вихователів до роботи в інклюзивних групах, тобто оснастити їх знаннями та вміннями здійснювати навчання та виховання дітей з особливими освітніми потребами. Мета статті – проаналізувати сучасні підходи до підвищення кваліфікації вихователів закладів дошкільної освіти щодо проблеми інклюзивної освіти дітей та знайти ефективні шляхи професійного розвитку педагогів з цього питання в умовах інституту післядипломної освіти. Методологічну основу дослідження склали праці українських та іноземних спеціалістів в області інклюзивної освіти. Для вирішення поставлених завдань використано загальнотеоретичні методи: аналіз, індукцію, дедукцію, порівняння, узагальнення інформації з теоретичних джерел і типологічний метод. Обґрунтовано необхідність реалізації системи підходів з підвищення кваліфікації вихователів закладів дошкільної освіти з питань інклюзивної освіти. Викладено та проаналізовано результати опитування педагогів закладів дошкільної освіти м. Києва, за якими встановлено, що переважна більшість учасників мають потребу в спеціальному навчанні з проблем інклюзивної освіти та розглядають місцем для такого навчання Інститут післядипломної освіти. Виявлено дієві підходи до підвищення кваліфікації вихователів, зокрема застосування в навчанні активних методів та включення в навчальний процес практичних занять на базі інклюзивних закладів. Серед найбільш затребуваних тем для підвищення кваліфікації зазначаються такі: організація освітнього процесу, співпраця з асистентом, розробка дидактичного обладнання, співпраця з батьками, психологічна підтримка педагога. Практична значущість дослідження полягає в інформуванні педагогічних колективів післядипломної освіти щодо специфіки потреб педагогів-дошкільників в царині підвищення кваліфікації з питань інклюзивної освіти. Ця проблема становить інтерес для студентів, що здобувають педагогічну спеціальність

Ключові слова: педагогічні інновації, професійний розвиток, педагогічна спеціальність, компетентнісний підхід, діти дошкільного віку, діти з особливими освітніми потребами

UDC 378:004(577)

DOI: 10.52534/msu-pp.8(4).2022.59-65

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Formation of Professional Competencies in the Study of Biophysics in Bachelor Students of Technological Specialities in the Context of Distance Learning

Article's History:

Received: 09.09.2022

Revised: 01.12.2022

Accepted: 28.12.2022

Suggested Citation:

Batsurovska, I.V., & Dotsenko, N.A. (2022). Formation of professional competencies in the study of biophysics in Bachelor students of technological specialities in the context of distance learning. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 59-65.

Abstract. Mastering the "Biophysics" discipline, Bachelor students of technological specialities need a deeper understanding of the physical processes that occur in biological systems. According to the educational programme, as a result of studying biophysics, Bachelor students of technological specialities develop programme competencies. Considering the orientation of the education system to the competence approach and the needs of the present in the development of distance education, the relevant issue is the development of a structural-methodological plan for the development of professional competencies in Bachelor students of technological specialities in the context of studying biophysics during distance learning. The purpose of the paper is to form professional competencies in the study of biophysics in Bachelor students of technological specialities in the context of distance learning. The research work uses the following methods: survey, analysis of the quality of educational results, and statistical processing of results using a nonparametric statistical Mann-Whitney *U*-test. Programme competencies in the study of biophysics in Bachelor students of technological specialities in the context of distance learning are outlined. It is proved that the distance course should contain information for conducting distance lectures, laboratory work, and practical classes. It is noted that the distance course should provide for the control of acquired knowledge during distance learning for Bachelor students of technological specialities based on test tasks, practical tests, and virtual-practical simulators. It is proved that test tasks, control sections and virtual-practical simulators provide monitoring of the results of educational activities of applicants for the higher education of technological specialities in the context of studying the "Biophysics" discipline in terms of qualitative and quantitative indicators: acquisition of competencies and obtaining points on the ECTS scale. The practical significance of the study is that as a result of such consistent work, the plan of which is covered, professional competencies are formed in Bachelor students of technical specialities in the context of studying biophysics during distance learning.

Keywords: study of physical processes, biological systems, competence approach, distance education, online course, knowledge control

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INTRODUCTION

The "Biophysics" discipline is devoted to the investigation of physical processes that take place in biological systems and examines the influence of external physical factors on living organisms. The modern development of medical and biological sciences is closely correlated with the field of biological physics. Biophysics is a related science, it stands at the intersection of chemistry, biology, and physics. By

correlating physical data with biological data, Bachelor students of technological specialities gain a deeper understanding of processes in biological systems, acquiring professional competencies. In today's conditions, considering the relevance of distance learning during the pandemic, there is a need to form professional competencies among Bachelor students of technological specialities in the study of biophysics.

Within the framework of integration into the global educational space, it is relevant to focus the curricula of applicants on a competence-based approach. Well-known international organisations deal with the problems of competence Education: UNESCO [1], the European Commission [2], the Council of Europe [3], etc. In the modern conditions of the development of the information society, there is a need to develop a technology for training applicants for higher education, which would provide opportunities for obtaining professional competencies in the digital environment. While the widespread adoption of digital technologies in higher education has caused the need to test various technological tools for high-quality teaching and active individual and collaborative learning [4]. The advantages of mass open online courses and learning management systems facilitate the learning process by offering materials and providing information exchange [5].

Chinese researchers Y. Yu and J. Li investigated the reforms of the mixed training regime for specialists [6]. In the writings, T. Wu investigated the theoretical aspects and practice of training specialists against the background of engineering education [7]. Researcher S. Titovskii identifies the leading areas and features of virtualisation and problems of student training [8]. Features of mixed learning are presented in the papers of W. Locke [9], I.K. Faroun [10], C.N. Kresnanto, W.H. Putri [11], blended learning – in the papers of M. Amelia [12], N. Vaughan [13]. Researchers examine the similarities and differences that occurred in blended learning from multiple angles. Technologies for the use of information and communication and distance learning for electrotechnical education are described in the papers of A. Mushi, J. Justo [14]. The introduction of innovations, in particular, in the education of engineers, was conducted by S. Milshtein, S. Tello [15].

It is important that students' education corresponds to their professional context [16]. The need for a deep understanding and unambiguous interpretation of the intended general and specific competencies of teachers should not be underestimated when it comes to qualitative assessment of results [17]. Postgraduate programmes should organise activities that confirm achievements in acquiring such skills and competencies [18]. Psychological and pedagogical analysis of the formation of professional competence in the process of distance learning is presented in the papers of S.V. Mikhailova [19]. The development of students' professional competence in the context of distance learning is highlighted in the papers of O.F. Yatsyna [20]. O. Gavryliuk, T. Vakaliuk, V. Kontsedailo investigated the criteria for selecting cloud-based training technologies for the development of professional competencies of bachelors majoring in statistics. [21]. Methodological approaches to the formation of professional competence of future technical and technological specialists of agricultural colleges are highlighted in the papers of I. Stadniichuk [22].

In the papers of the authors [23; 24; 25], general aspects of methods for studying technical disciplines and introducing distance technologies in engineering education

are outlined. Notably, some aspects were initiated that partially cover the problems of training specialists in electrical engineering specialities and methods of teaching video lectures in distance courses. However, the issue of studying biophysics in the context of distance learning by future specialists of technological specialities in the context of a competence-based approach has not been sufficiently investigated.

The purpose of the study is to determine the effectiveness of the development of professional competencies in bachelors of technological specialities through the introduction of a structural-methodological plan for studying biophysics during distance learning.

The following tasks had to be completed to achieve this goal:

- to investigate the effectiveness of the development of professional competencies in Bachelor students of technological specialities;
- develop a structural-methodological plan for studying biophysics during distance learning;
- perform statistical verification of implementation performance of structural-methodological plan for studying biophysics by bachelors of technological specialities in the conditions of distance learning.

The scientific originality of the study is the development of a structural-methodological plan for studying biophysics by Bachelor students of technological specialities in the context of distance learning, indicating educational tools for its implementation. This plan provides an opportunity to consider not only the receipt of points according to the quality of tasks performed in the conditions of distance learning but also the acquisition of programme competencies by applicants for the higher education of technological specialities when studying the “Biophysics” discipline.

MATERIALS AND METHODS

The study was conducted at the Mykolayiv State Agrarian University in the 2021-2022 academic year. In the first stage of the study, the method of evaluating educational activities was used, considering quantitative and qualitative indicators of the results of acquiring professional competencies in Bachelor students of technological specialities while studying biophysics. A nonparametric statistical Mann-Whitney *U*-test was used to compare the results obtained in the experimental and control groups on two scales [26], which is used to estimate the difference between two samples in terms of the level of any feature measured in quality. As a result of the experiment, such methods as analysing the quality of educational results and statistical calculation of the effectiveness of applying the proposed technology were used. The analysis of the quality of educational results was conducted in the context of a distance course in biophysics. The first scale considers the comparison of self-assessment, and the second scale – the results of the analysis of the quality of knowledge. 31 applicants for the higher education of the 1st year of speciality 204 “Technology of production and processing of livestock products” took part in the experiment. 15 people were in the control group and 16 – in the experimental group.

RESULTS AND DISCUSSION

The development of professional competencies among Bachelor students of technical specialities leads to the formation of biophysics tasks based on general principles of physics, considering the atomic and molecular structure of substances.

The authors share the methodological approaches of researcher N.V. Serdyukova [27] regarding the teaching of a physics course for higher education applicants with non-core training in this discipline, in particular, the introduction of innovative technologies and educational tools. Information technologies have a positive impact on the quality of training in the context of studying physical phenomena

since in real conditions experimental modelling of some processes is difficult for technical reasons [28]. The implementation of digital online technologies in the process of teaching physics and technical disciplines in higher education institutions requires the development of a modern model of the educational process, the key difference of which should be competence orientation [29].

Figure 1 presents the structural-methodological plan developed by the authors of this study for the development of professional competencies in bachelors of technological specialities in the context of studying biophysics during distance learning (Fig. 1).

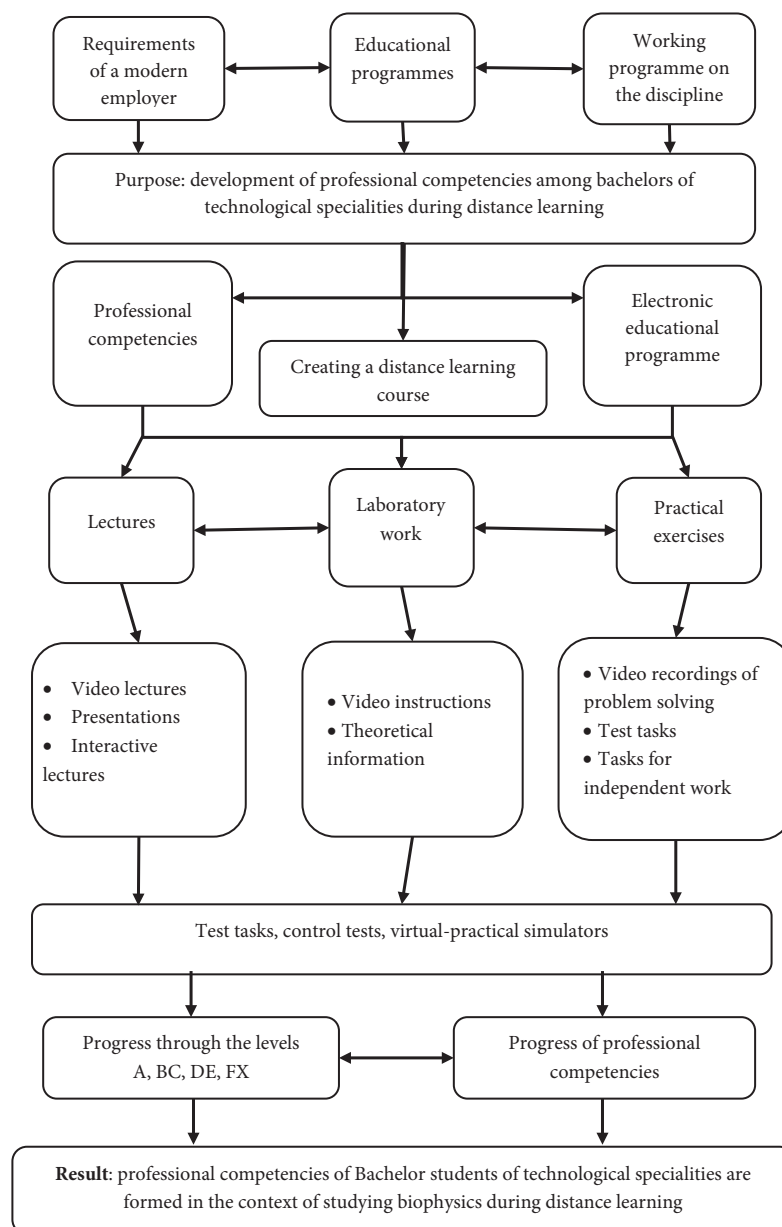


Figure 1. Structural and methodological plan of development of professional competencies in Bachelor students of technological specialities in the context of studying biophysics during distance learning

Source: developed by the author of this study

The requirements of a modern employer, educational and work programmes in the discipline lead to the goal: the development of professional competencies among Bachelor students of technological specialities during distance learning. According to the goal, a distance course is created, which is closely related to the electronic educational programme and professional competencies.

According to the educational programme, as a result of studying biophysics, Bachelor students of technological specialities of the discipline develop programme competencies. Those include the ability to use knowledge of biophysics to the extent necessary to achieve other results of the educational programme; being able to apply modern mathematical methods to solve practical problems related to the research and design of biotechnological processes, using knowledge of physics for the analysis of biotechnological processes; using microbiological, chemical, physical, physico-chemical, and biochemical methods, being able to conduct chemical, technological, and microbiological control of microbiological purity and sterility of biotechnological products for various purposes; based on knowledge about the laws of mechanical hydromechanical heat and mass transfer processes and basic structure design features, being able to choose the appropriate equipment in the process of designing biotechnological products for various purposes to ensure their maximum efficiency.

The formation of a distance course for Bachelor students of technical specialities is based on the development of content for conducting distance lectures, laboratory work, and practical classes. The distance course also provides for monitoring the acquired knowledge during distance learning with bachelors of technological specialities based on test tasks, practical tests, and virtual-practical simulators.

It is necessary to develop educational content in such a way that students understand the physical and physicochemical processes that occur in living organisms, the results of the influence of physical factors on living systems, have an idea of methods for measuring physical parameters and the physics of processes in biological systems to form these professional competencies in bachelors of technical specialities during distance learning.

Lectures. The formation of lecture content involved the development of video lectures, presentations, and interactive lectures. Notably, attending a video lecture, viewing, and taking notes on a presentation, and working through an interactive lecture should not exceed one academic hour in the context of working hours. The subjects of lectures precede the laboratory and practical classes.

Video lecture should not exceed 15-20 minutes. If the video lecture provides an explanation of the presentation, then the presentation should not exceed 7-12 slides. When recording a video lecture, it is advisable to consider some aspects of its perception. The teacher should speak clearly and understandably. The choice of the colour plan should be according to the harmonious perception by the eye. It is advisable to use pastel colours, excluding red, orange, and other bright colours. The teacher's clothing should be in

business style and consider the background colour. If the video lecture involves explaining the presentation, then it is better to consider that eye perception works better if there are dynamic processes every 30 seconds. It is advisable to use animations of certain biophysical processes and systems.

Presentations should not be too long. They should not to exceed 15 slides. It is advisable to combine presentations both with watching a video lecture and working in the context of an interactive lecture. The presentation should contain more visualisations: logical diagrams, tables, and technological processes, cover the analysis of the structure of biological systems.

Interactive lectures provide for working with text information. This type of presentation of educational material implies an inverse relationship with the applicant for higher education. Text information is divided into small parts, followed by a question for reflection. The volume of one part of such material should not exceed two thousand characters. It is advisable to combine text information with presentations, including illustrations and diagrams. Each interactive lecture should contain a list of recommended sources and useful links for independent work.

Laboratory work. Creating content in a remote course for laboratory work involves preparing video instructions and theoretical information.

The *video instructions* have to be 2-5 minutes long. The video instruction should present the technology and procedure for performing measurements in the laboratory work. The image should be clear, and the laboratory assistant's actions – understandable. If necessary, certain processes or actions can be explained to better understand the biophysical process.

Theoretical information should be presented in the form of text, which includes a brief description of the subject and purpose of the lesson, studying the main provisions and independently processing them. Such content should be prepared for the purpose of teaching students to determine and measure the physical parameters of biological systems, model the interaction of physical factors with biological systems, and use educational and reference literature.

Practical classes. In practical classes of the distance course, the teacher organises studies by higher education applicants of certain theoretical provisions from the biophysics course and contributes to the formation of skills for their practical application by performing practical tasks.

Video recordings of problem solving. Video recordings of solving problems in biophysics need to focus on a logical sequence of the solution. Thus, a video with explanations of the problem solution must necessarily include a presentation of the problem condition and a description of the content of new terms and expressions, a brief record of the problem condition, drawings and schematic explanation, analysis of the problem condition to clarify its physical essence, that is, biophysical phenomena, processes and states of the system are clarified, and physical laws and formulas that are necessary for solving the problem are restored in the memory of bachelors of technological specialities. It is advisable

to present a plan for solving the problem and express the relationships between values in the form of formulas. The analysis of the obtained results and the search and consideration of other ways to solve the problem expand the possibilities of logical thinking of students.

Test tasks. Biophysics testing is a method of checking the level of acquisition of competencies in an academic discipline. The use of computer testing methods in the context of a distance course depends on the level of proficiency of the student in educational material in biophysics. In a remote course, testing is usually used to solve simple problems and involves either entering a numerical result or choosing the correct numerical answer. The purpose of such tasks is the actualising of knowledge, preliminary preparation for control tests and modular colloquiums on biophysics.

Tasks for independent study. An Independent solution of biophysical problems is training for the mental activity of a bachelor of technological speciality. Solving a problem for the independent study can be divided into three stages: biophysical (a closed system of equations is created), mathematical (obtaining a solution to the problem), and analysis of the solution. Bachelor students of

technological specialities independently learn to solve problems during extracurricular hours and demonstrate their skills on test papers, the photo report of which is sent to the teacher of the distance course. The complexity of tasks should be decided based on the level of training of future bachelors-technologists. Solving even a simple problem in biophysics contributes to the development of a scientific worldview, and the use of distance courses improves the quality of practical classes in biophysics.

Test tasks, control tests, and virtual-practical simulators at the end of the semester contribute to the diagnosis of the acquisition of levels according to the ECTS scale and ensure the acquisition of professional competencies.

Developed professional competencies for Bachelor students of technical specialities in the context of studying biophysics during distance learning are the result.

The Mann-Whitney *U*-test [29] was used to compare the results of experimental and control groups on two scales. Table 1 displays the empirical values of the Mann-Whitney *U*-test on comparing the results of the experimental and control groups on two scales before the start of the experiment.

Table 1. Empirical values of Mann-Whitney *U*-test on comparing the results of the experimental and control groups on two scales before the start of the experiment

Scales	Mean value in the experimental group	Mean value in the control group	Empirical value	Value level
Scale 1	18.5	16.067	86.5	0.184
Scale 2	30.0	20.933	149.0	0.249

No substantial differences were identified between the experimental and control groups on the investigated scales. At the end of the experiment, a statistical comparison was

also made and the empirical value was calculated based on the Mann-Whitney *U*-test. The results of the analysis are presented in Table 2.

Table 2. Empirical values of the Mann-Whitney *U*-test on comparing the results of the experimental and control groups on two scales after the end of the experiment

Scales	Mean value in the experimental group	Mean value in the control group	Empirical value	Value level
Scale 1	19.125	16.067	88.5	0.211
Scale 2	208.625	20.933	230.0	0.988

There are substantial differences on a scale of 2 between the experimental and control groups ($U = 230$, $p < 0.001$). The indicator in the experimental group is higher than in the control group ($X_1 = 208.625$, $X_2 = 20.933$).

Thus, the structural-methodological plan for the development of professional competencies in Bachelor students of technological specialities in the context of studying biophysics during distance learning is effective.

CONCLUSIONS

The development of professional competencies among bachelors of technological specialities in the study of biophysics in the context of distance learning occurs through working with an online course. The distance course should contain information for conducting distance lectures, laboratory work, and practical classes. The study describes the

programme competencies that higher education applicants acquire when studying the “Biophysics” course. The development of a structural-methodological plan for the development of professional competencies in bachelors of technological specialities in the context of studying biophysics during distance learning was prompted by the needs of a modern employer, educational programmes for training applicants for higher education in technological specialities and the requirements of the work programme in the “Biophysics” discipline. The formation of a distance course is based on an electronic educational programme and professional competencies that must be acquired in the process of studying the “Biophysics” course. Lecture material in the context of distance learning is presented in the form of video lectures, presentations, and interactive lectures. Laboratory classes in the “Biophysics” discipline are based

on the presentation of theoretical information in the form of video instructions. When presenting practical classes in a distance course in biophysics, video recordings of problem solving, test tasks, and tasks for independent study are used. In addition, the distance course should provide for the control of the acquired knowledge during distance learning with students of technological specialities based on test tasks, practical tests, and virtual-practical simulators. Diagnostics of progress at levels A, BC, DE, FX and in professional competencies are provided by test tasks, control tests, and virtual-practical simulators at the end of the semester. As a result of such consistent work, professional competencies are formed in Bachelor students of technical specialities in the context of studying biophysics during distance learning. Statistical calculation using the

Mann-Whitney U-test for comparing the results of the experimental and control groups on two scales before and at the end of the experiment indicates that the use of a structural-methodological plan for the development of professional competencies in students of technological specialities in the context of studying biophysics during distance learning is effective because at the end of the experiment there are substantial differences in the indicators of the experimental and control groups.

Prospects for further research will be the development and implementation in the educational process of audiovisual support of a distance course for the development of professional competencies in bachelors of technological specialities during the study of the "Physics" discipline in the conditions of distance learning.

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Формування професійних компетентностей під час вивчення біофізики в бакалаврів технологічних спеціальностей в умовах дистанційного навчання

Анотація. Засвоюючи дисципліну «Біофізика», бакалаври технологічних спеціальностей потребують більш глибокого опанування фізичних процесів, які відбуваються в біологічних системах. Згідно з освітньою програмою, у результаті вивчення біофізики в бакалаврів технологічних спеціальностей формуються програмні компетентності. Зважаючи на орієнтацію системи освіти на компетентнісний підхід та потреби сьогодення в розвитку дистанційної освіти, актуальним питанням є розробка структурно-методичної схеми формування професійних компетентностей у бакалаврів технологічних спеціальностей у контексті вивчення біофізики під час дистанційного навчання. Мета авторської розробки – формування професійних компетентностей під час вивчення біофізики в бакалаврів технологічних спеціальностей в умовах дистанційного навчання. У дослідженні використано такі методи: опитування, аналіз якості освітніх результатів, статистична обробка результатів за допомогою непараметричного статистичного критерію UМанна-Вітні. Окреслено програмні компетентності під час вивчення біофізики в бакалаврів технологічних спеціальностей в умовах дистанційного навчання. Обґрунтовано, що дистанційний курс повинен містити інформацію для проведення дистанційних лекцій, лабораторних робіт та практичних занять. Наголошено, що дистанційний курс має передбачати контроль отриманих знань під час дистанційного навчання в бакалаврів технологічних спеціальностей на основі тестових завдань, практичних зрізів та віртуально-практичних тренажерів. Доведено, що тестові завдання, контрольні зрізи та віртуально-практичні тренажери забезпечують моніторинг результатів навчальної діяльності здобувачів вищої освіти технологічних спеціальностей в контексті вивчення дисципліни «Біофізика» з погляду якісних та кількісних показників: набуття компетентностей та отримання балів за шкалою ECTS. Практичне значення дослідження полягає в тому, що в результаті такої послідовної роботи, схему якої висвітлено у статті, формуються професійні компетентності в бакалаврів технічних спеціальностей в контексті вивчення біофізики під час дистанційного навчання

Ключові слова: вивчення фізичних процесів, біологічні системи, компетентнісний підхід, дистанційна освіта, онлайн-курс, контроль знань

UDC 378.147:744

DOI: 10.52534/msu-pp.8(4).2022.66-72

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Teaching Descriptive Geometry, Engineering, and Computer Graphics in the Context of Rapid Development of Digital Production

Article's History:

Received: 20.08.2022

Revised: 25.11.2022

Accepted: 28.12.2022

Suggested Citation:

Habovda, O.V. (2022). Teaching descriptive geometry, engineering, and computer graphics in the context of rapid development of digital production. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 66-72.

Abstract. The relevance of the study is due to the continuous development of automated design systems and global trends in the digital transformation of production at all levels of the product life cycle. Since one of the main principles of education is integration with science and production, this integration is the main condition for its further development and a factor in ensuring its quality. The product life cycle begins with project design, which students of technical specialities begin to master by studying descriptive geometry, engineering, and computer graphics. In this course, the skills of working in automated design systems are pawned, so its teaching should take place using updated technologies that the present needs. The purpose of the study is to analyse the experience of teaching graphic disciplines in higher educational institutions and to substantiate the methods of studying the discipline "Engineering and computer graphics" based on the author's experience, considering trends in the development of digital production. The research work was conducted using general scientific methods by analysing scientific-technical information on the subjects covered and using the method of pedagogical experiment. The study suggests using computer-aided design systems starting with the study of descriptive geometry, provides practical ways to solve classical problems of descriptive geometry by means of automated design systems, defines the minimum skills within the course to ensure further assimilation of the capabilities of automated design systems in special courses, during the implementation of course projects and to reduce the period of adaptation of the future specialist to professional activities. The practical importance of the research is in the development of a methodology for the transition from conventional methods of studying descriptive geometry, which involve the use of drawing tools, to modern ones using computer-aided design systems, which contributes to their accelerated mastering by students to further apply them in the study of technical disciplines

Keywords: latest technologies in production, automated design systems, computer modelling, innovative teaching methods, graphic disciplines

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INTRODUCTION

Product design skills for students of technical specialities are pawned when studying descriptive geometry, engineering, and computer graphics, and it is from this course that students begin to master working in computer-aided design systems.

Due to the French researcher Gaspard Monge, who in the 18th century laid the foundations of descriptive geometry – the graphic language of all technology, proposing a method of the orthogonal projection of spatial objects on a plane, engineers got a solution for the image of projected products in drawings. Due to the AutoCAD system

released in 1982 by the American company Autodesk – the first CAD (Computer-Aided Design) – system for a personal computer, the designer replaced a drawing board with a computer.

Today, due to the rapid development of computer-aided design (CAD) systems, which contain not only tools for creating three-dimensional models and drawings, but also engineering analysis systems, product data management systems, etc. (for example, SolidWorks Simulation, SolidWorks Flow Simulation, SolidWorks Motion, and other SolidWorks software products), a modern constructor do

not use a computer as an electronic drawing board. They have the opportunity to create virtual three-dimensional models of parts and assemblies of the product, test it and individual parts and components for durability, endurance, and vibrations, simulate fluid flow, heat exchange, hydrodynamic forces, analyse the movement of links of mechanisms, and much more.

Tools such as parameterisation, which can be used to control the geometry of objects by establishing geometric and dimensional dependencies between them, and the ability to create associative drawings of three-dimensional models in which all types are associated with the model so that changes in the model lead to a change in the image in each associative form, and, conversely, changes in the drawings can change the model (in SolidWorks).

The emergence of modern CAD could not but affect the conventional methods of teaching descriptive geometry and computer engineering graphics, so the issues of graphic training of students are actively discussed in many scientific and pedagogical papers, the authors of which, agreeing that with the advent of 3D modelling made it necessary to change the methods, often express diametrically opposed opinions about these changes, especially in regard to teaching descriptive geometry.

The purpose of the study is to develop a methodology for teaching descriptive geometry and computer engineering graphics using CAD. An analysis of the experience of teaching graphic subjects in higher educational institutions was conducted, problems of graphic training of students were identified, and the methodology of teaching the discipline "Engineering and computer graphics" based on the author's experience was substantiated to achieve this goal.

The results of the analysis of scientific and methodological papers on the problem under study confirm its importance and the lack of unanimity of opinions on the methodology of teaching graphic disciplines.

An interesting idea about the classical name of the discipline is expressed by the authors of Yu.M. Kovaliov and V.M. Vereshchaha: "The consequence of the development of science and technology was the differentiation of requirements for geometric modelling, which ceased to be mainly graphic. Therefore, classical courses in descriptive geometry and engineering graphics are no longer sufficient for modern engineers or architects and should be supplemented with ideas and methods of computational geometry, multidimensional geometry, and systems theory. That is why the classical name is being changed to 'Applied geometry'. All these areas have a common theoretical basis – axiomatic models of space, the theory of transformations, and means of providing visibility..." [1]

Most Ukrainian researchers believe that teaching the section on descriptive geometry in the course of engineering and computer graphics should take place according to the conventional method using a drawing tool, and then in the section on engineering graphics – using computer technologies (2D and 3D modelling) [2]. Others believe that teaching using the most modern CAD systems

should start from the 1st semester, that is, with the section on descriptive geometry [3-5], including researchers from other countries. Spanish researchers R. Moreno of the University of Granada and A. Bazan of the Higher Technical School of Civil Engineers (Madrid), in their joint paper, expresses the following opinion: since drawing tools have changed dramatically in recent years, this has had implications for teaching descriptive geometry. CAD packages replace drawing manually. This has made the subject more interesting and attractive for students, as they can now create high-quality graphic works [6]. There is also a more radical approach, namely, the rejection of the study of descriptive geometry. Thus, the researcher V. Rukavishnikov in his paper [7] emphasises that "modern three-dimensional computer geometric models, having the properties of not only geometric but also mathematical and physical models, have acquired an integrative character. The dimensions of the model and the modelling object began to coincide, which removed many problems that previously had to be solved when creating geometric models using descriptive geometry technology."

According to researchers M.M. Kozyar and Z.K. Sasiuk, the educational process of studying the discipline in Ukrainian universities is well provided with textbooks, the authors of which are such researchers as V.E. Mikhailenko, V.M. Naydysh, V.Ya. Naumenko, V.H. Shevchenko, and others. "However, their content does not consider the present and does not give students the opportunity to master it perfectly. A scientific and pedagogical worker should focus on a scientifically based solution to the problems of improving and optimising the process of teaching descriptive geometry, considering trends in world technical education" [8].

Modern multimedia tools enable the creation of manuals with hyperlinks to illustrations, models of phenomena and devices in dynamics, etc. In European countries that have similar problems with teaching graphic disciplines, electronic textbooks have already existed for quite some time. For example, researchers from the University of Zagreb (Croatia) have created a textbook on descriptive geometry, where the presentation of classical content is implemented using information technologies and the introduction of 3D modelling. At the Krakow University of technology, descriptive geometry problems are solved using computers with AutoCAD software, and an e-learning platform with a full set of features. "The main task during training is to make the student realise that the computer can only do what the operator makes it, and it is necessary to have theoretical knowledge to be able to use it to solve a given problem" [9].

Since among the principles of education specified in the Law of Ukraine "On Education" [10], there are principles of the scientific nature of education and integration with the labour market, this integration is the main condition for further development and a factor in ensuring its quality. Digital production involves creating a design and technological environment for the simultaneous work of all participants in the production process with a single virtual electronic product model.

The originality of the research work lies in the application of computer-aided design systems in the study of descriptive geometry.

MATERIALS AND METHODS

The study was conducted in several stages using general scientific methods, in particular, the analysis of scientific-technical information on this subject, comparison of alternative scientific opinions on the problem under study, synthesis, and systematisation of practical experience in the use of CAD in the process of teaching the discipline “Engineering and computer graphics” (ECG), the method of pedagogical experiment. The methodology of teaching the ECG discipline is understood as the organisation of the process of studying the discipline (a set of principles, content, methods, means, and forms).

In the first stage, based on the author’s previous study on the concepts of digital production, which require the introduction of complex systems of automation (CAS) of the CAD/CAM/CAE/CAPP/PLM/ERP class at Ukrainian enterprises [11], the requirements for graphic training of mechanical specialists during the entire period of study at the University were determined.

In the course of the study, attention was focused on the principles of continuity in learning, which would provide students with the necessary knowledge in the further development of technical disciplines that are in a structural and logical connection with the ECG discipline.

In the second stage, using the method of system analysis, scientific-pedagogical work on this subject and the experience of teaching graphic disciplines in higher educational institutions of Ukraine were analysed, controversial issues regarding teaching methods were considered, and difficulties that students will face at the beginning of studying graphic disciplines were noted.

In the third stage, a methodology for teaching engineering and computer graphics, which was tested at Mukachevo University, is proposed. The method of a pedagogical experiment was used, which was conducted in the laboratory of engineering and computer graphics using Kompas-3D CAD (in the near future – SolidWorks CAD). End-to-end use of CAD in the study of all sections of ECG is proposed. The rationale for the inexpediency of using a drawing tool in the study of descriptive geometry – the first section of the discipline is given. Examples of solving descriptive geometry problems using CAD are given.

RESULTS AND DISCUSSION

In 2011, the Association of Industrial Automation of Ukraine of Ukraine (APPAU) was established, which aims to unite with the IT sector and high-tech communities and direct the general movement to accelerate the modernisation of Ukrainian production by introducing the latest technologies. Practitioners who train applicants for technical specialities should also contribute to this movement by providing up-to-date knowledge in the training of a valuable engineer. The result of this training is the acquisition of skills

in geometric modelling and product design (CAD-system), its engineering analysis (CAE-system), familiarisation with computer support systems for product manufacturing (CAM-system), technologies for product lifecycle management (PLM), etc., which will give confidence to the future specialist and accelerate their adaptation to professional activities.

“The era of drawings is a thing of the past. The world’s focus is on digital production technologies ...” [12]. The author fully agrees with this opinion. The problem with implementing PLM technology in Ukraine, among other things, is the rupture of the integrated “design – manufacturing” chain. It is the use of drawings that breaks this chain. This suggests a conclusion about the dispute between proponents of the study of descriptive geometry and their opponents: at least, as long as drawings are used, one should not abandon the study of descriptive geometry, because the ability to represent a spatial object from a two-dimensional image and, conversely, create a drawing from a spatial object is provided by descriptive geometry. Even if the drawing is generated automatically, it is the designer who decides how many forms the drawing should have, what sections and cross-sections are needed so that the part or product becomes fully defined and can be manufactured.

In addition to the fact that descriptive geometry is one of the disciplines that form the basis of engineering education, its study contributes to the development of spatial representation. Unfortunately, applicants for education who graduate from schools where, in the vast majority, they do not learn drawing, find it difficult to study descriptive geometry due to the insufficient development of spatial representation, without which it is impossible to become an engineer. The perception of educational information is problematic for 80% of students [13]. From the standpoint of psychology, they have an insufficiently developed right hemisphere of the brain, which is responsible for imaginative thinking. “The course of descriptive geometry is one of the few in the university that affects the development of the right hemisphere of the brain and compensates for the overload of the left hemisphere with information that comes from studying most other disciplines” [14].

The use of a drawing tool in the study of descriptive geometry in the present time is one of the factors that hinder the process of mastering the discipline. When drawing boards were removed from graphics labs, and computers were not yet a widely available tool, students switched to T-squares, but at that time they still knew how to use this tool, since they were still taught drawing at school. Nowadays, there is no need to draw manually.

The transition period has long ended, and engineering graphics laboratories are equipped with computers with installed software (at least AutoCAD or Compass Graphic), so the use of a computer in the study of graphic disciplines is logical and fully justifies itself.

This is what is stated in [15]: “...It is identified that today there are actually two components of the methodology for teaching engineering graphics: conventional and computer. Moreover, the transition period from conventional

engineering graphics to computer graphics is clearly traced. It is established that the disadvantage of the conventional methodological system of training engineering and graphic disciplines of future mechanical engineers is conservatism, non-compliance of the content of engineering and graphic training with the requirements of modern production and development of equipment and technologies. There is a typical situation of teaching engineering graphics with the dominance of reproductive teaching methods, limited scientific-methodological tools of an innovative nature, proper educational, and methodological support for the organisation of independent work. As a result, there is a noticeable tendentious decrease in academic aspirations and, accordingly, students' academic achievements, substantial difficulties in mastering academic subjects in engineering graphics."

Every year there is a reduction in the number of classroom classes. This fact makes it necessary to optimise the methodology for studying ECG. The use of CAD allows for accelerating the acquisition of the necessary skills. In addition, with the development of multimedia tools, the lecturer no longer uses blackboards and crayons. Lectures-presentations made in PowerPoint, demonstrations of building 3D models substantially increase visibility and are better perceived and assimilated by students. One of the advantages of using PowerPoint is that it is possible to divide the solution to a given problem into separate steps and gradually demonstrate them using various animations. To strengthen the motivation to study ECG, there is a need to find a place for periodic demonstration of the practical application of knowledge in product design and production from the first year when conducting lectures, as researchers suggest in the work [16]: "...Theoretical material from the course of technical drawing, in parallel with the explanations of the teacher, is periodically accompanied by a demonstration of educational presentations (video materials) aimed at familiarising students with technology and modern production, the design process... . This activates the mental activity of students, since they operate in the

imagination with spatial images of kinematic elements, comparing them with the corresponding symbolic (conventional) designations, reproducing basic information in memory, modelling the dynamics of their work."

The author believes that to optimise the subject of practical work, it is possible to reduce the execution of con-jugations and other geometric constructions, leaving them only in lectures, since CAD tools perform these constructions easily and are almost unrelated to conventional construction methods. Familiarisation with the methods of axonometric representation of objects is also proposed to be conducted only in lectures since the construction of axonometric images manually takes students a lot of time, which is not enough to perform current tasks, and axonometric views are also automatically generated on drawings if necessary.

When performing tasks in descriptive geometry at Mukachevo University, the computer is used only as an electronic drawing board. Students quickly master working in the Compass-3D environment, as the work requires the ability to use only three panels: "Geometry", "Editing" and "Annotation". A separate lecture is not necessary to get these skills: it is possible to learn everything in practice. In addition, students use the developed laboratory workshop on ECG (in 2 parts), which provides a step-by-step sequence of completing tasks. As a type of electronic document, "Fragment" is used – an auxiliary type of graphic document that is characterised by the absence of a frame, main label, and other document design objects. When using CAD, precise lines (parallel, perpendicular, and at any angle) are easily constructed, which is difficult to achieve manually. In addition, the dimensions are precisely set, which eliminates errors. Relative to the curves of the intersection lines of surfaces, they are constructed with sufficient reliability from the obtained points using the "Spline by points" tool of the "Geometry" panel.

Examples of solving problems in descriptive geometry using Kompas-3D and SolidWorks CAD are shown in Figures 1 and 2.

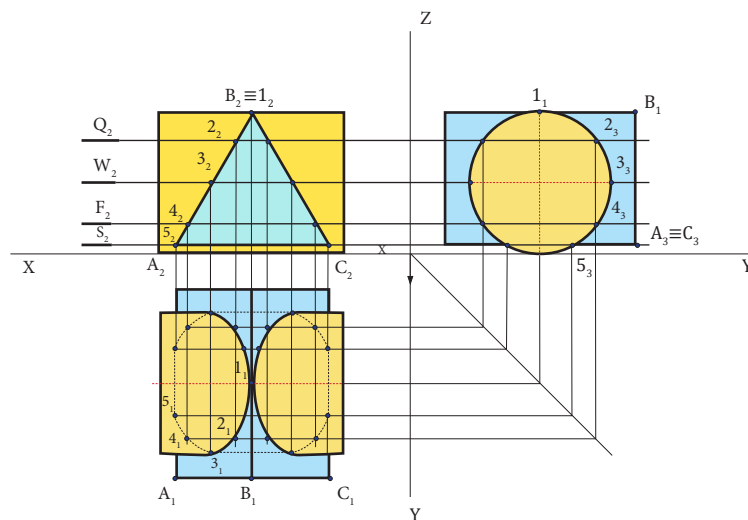


Figure 1. Solution of the problem of constructing lines of intersection of a cylinder and a prism in CAD Compass 3D
Source: developed by the authors based on their own examination

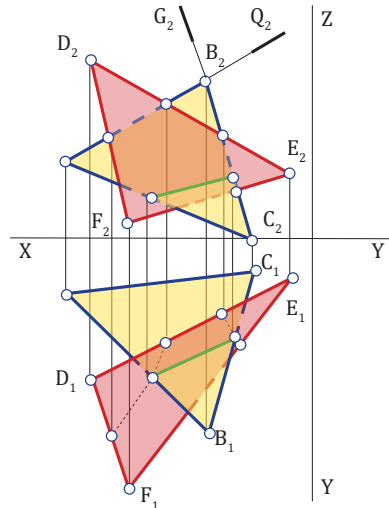


Figure 2. Solving the problem of constructing a line of intersection of two planes in SolidWorks CAD

Source: developed by the authors based on their own examination

In the engineering graphics section for mastering the subject “Projection drawing. Forms, cuts, cross-sections” and “Threads. Threaded connections” students use 2D modelling, working in an electronic document “Sketch”. After mastering this material, the student is considered prepared for 3D modelling and gets acquainted with the structure of parametric models of parts and assemblies, based on which working drawings of parts and assembly drawings are generated, followed by the creation of an electronic specification in manual mode or with automatic filling in of the specification with basic objects connected to it.

When drawing up the work programme on ECG, the principle of continuity in training is guiding, that is, the subject of the discipline is coordinated with the subject of disciplines that should be provided by ECG. These disciplines include an in-depth study of design and modelling in CAD/CAM/CAE systems, classical disciplines – theory of mechanisms, machines, and machine parts (to ensure the implementation of course projects), and specialised design disciplines. Considering this, the ECG discipline plays an important role in ensuring the principle of continuity and consistency of training throughout the entire training period.

Evidently, in the ECG course, an education applicant should learn the theoretical foundations of designing spatial objects, get acquainted with the standards of the unified system of design documentation, get a concept of connections, learn to read, and perform assembly drawings, fulfil specifications, know the requirements for working drawings of parts, while performing all practical tasks using CAD. The student, already in the framework of this course, masters the basic operations of building 3D models with subsequent automatic generation of associative drawings on them, learns to perform simple 3D models of assemblies.

Further study of ECG is planned using SolidWorks CAD as a system with more advanced functions, the presence of many modules and as a CAD widely used in machine-building design organisations, enterprises, and

senior courses in the study of computer design and modelling. In general, the author supports the opinion that it is advisable to master one of the most modern computer-aided design systems in-depth (within the capabilities of the university) in all special courses related to design, engineering analysis, and technological preparation of production, which contains the necessary functional modules. By focusing on working in a single system, students have the opportunity to learn CAD tools more deeply. However, there is another opinion. The authors [17] believe that “to create favourable conditions for successful professional and graphic training of a future CAD specialist, it is important to ensure the organisation of a perfect educational process in engineering and computer graphics based on the integration of graphic software products, such as AutoCAD and SolidWorks.” When choosing CAD systems, it is advisable to have information about which of them are used at the most modern enterprises in the region – potential places of employment for future specialists.

CONCLUSIONS

The study explained how it is proposed to solve problems of descriptive geometry using CAD, and what minimum skills, according to the author, students should get in the framework of the ECG course to move forward in familiarising themselves with the huge opportunities of modern CAD and acquiring skills of their application both in the implementation of course projects in the learning process and in future engineering activities.

Teaching the discipline “Engineering and computer graphics” should be innovative, considering the global trends in the development of digital production, since with it the development of computer-aided design systems begins, without the assimilation of which the future specialist will not be able to quickly adapt to their professional activities and be competitive in the labour market.

The innovative nature of teaching should take place through the use of multimedia computer tools during lectures

and the end-to-end use of CAD when students perform practical tasks, starting with descriptive geometry, and independent processing of materials presented in electronic textbooks with available hyperlinks to interactive illustrations. Such innovative methods are used in world practice. Therewith, the interdisciplinary connection of ECG with professionally oriented academic disciplines should be considered, which contributes to the conscious assimilation of the necessary knowledge, motivates the student to study, and also focuses on the connection of the ECG course with technology and modern production.

As the research results have shown, the introduction of CAD in the educational process, starting with descriptive geometry, has a positive effect on students' perception and

assimilation of geometric modelling skills, contributes to the development of spatial thinking, and improves training for further mastering of CAD in the study of disciplines that should be provided by ECG. It is advisable to coordinate the choice of CAD systems with the trends of their development at the most modern enterprises in the region – potential places of employment for future specialists. End-to-end application of the entire CAD package allows future specialists to get acquainted with the production process throughout the entire product life cycle and prepare for competition in the labour market.

The possibilities of end-to-end implementation of computer-aided design systems in specialised courses throughout the entire learning process are a prospect for further research by the author.

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Викладання нарисної геометрії, інженерної і комп'ютерної графіки в умовах стрімкого розвитку цифрового виробництва

Анотація. Актуальність статті зумовлено невідомим розвитком систем автоматизованого проектування та світовими тенденціями цифрової трансформації виробництва на всіх рівнях життєвого циклу виробу. Оскільки один з основних принципів освіти – інтеграція з наукою і виробництвом, ця інтеграція є головною умовою її подальшого розвитку та фактором забезпечення її якості. Життєвий цикл виробу починається з проектування, опановувати яке студенти технічних спеціальностей починають з вивчення нарисної геометрії, інженерної та комп'ютерної графіки. Саме в цьому курсі закладаються навички роботи в системах автоматизованого проектування, тому його викладання має відбуватися за оновленими технологіями, яких потребує сьогодення. Метою роботи є аналіз досвіду викладання графічних дисциплін у вищих навчальних закладах, а також обґрунтування методів вивчення дисципліни «Інженерна і комп'ютерна графіка» на основі власного досвіду автора з урахуванням тенденцій розвитку цифрового виробництва. Дослідження проводилися із застосуванням загальнонаукових методів шляхом аналізу науково-технічної інформації за порушеною тематикою та методом педагогічного експерименту. У статті запропоновано використовувати системи автоматизованого проектування починаючи з вивчення нарисної геометрії, надаються надано практичні способи розв'язання класичних задач нарисної геометрії засобами систем автоматизованого проектування, визначено мінімальні навички в межах курсу для забезпечення подальшого засвоєння можливостей систем автоматизованого проектування в спеціальних курсах, під час виконання курсових проектів та для скорочення терміну адаптації майбутнього фахівця до професійної діяльності. Практичне значення дослідження полягає в розробці методики переходу від традиційних методів вивчення нарисної геометрії, що передбачають застосування креслярських інструментів, до сучасних з використанням систем автоматизованого проектування, що сприяє їхньому прискореному опануванню студентами з метою подальшого застосування при вивченні технічних дисциплін

Ключові слова: новітні технології в промисловості, системи автоматизованого проектування, комп'ютерне моделювання, інноваційні методики викладання, графічні дисципліни

UDC 371.3:629.331

DOI: 10.52534/msu-pp.8(3).2022.73-80

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Methodological Approaches in Training Specialists of Professional Education of Motor Transport Profile for Teaching Road Safety

Article's History:

Received: 14.09.2022

Revised: 05.12.2022

Accepted: 28.12.2022

Suggested Citation:

Horishna, N.M. (2022). Typology of social skills and their impairments in children with autism spectrum disorders. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 73-80.

Abstract. The relevance of the study is due to the dynamism of changes in all areas of activity, including the automotive industry. The purpose of this paper is to investigate the main ways of providing professional education in the field of motor transport, considering the current needs of the digital society. Among the methodological techniques used, theoretical and functional approaches, logical analysis, synthesis, deduction, and comparative methods are notable. In the course of the study, it is determined that now the intensity of the educational process and the activation of cognitive activity require new forms of training from future specialists, which provide an opportunity to learn a lot of material in a short period of time. It is proved that the need for new productive approaches to learning is due to the fact that today the amount of information and knowledge that students should possess has increased. The main reasons leading to an insufficient level of road safety in Ukraine in comparison with the countries of the European Union are highlighted. An important aspect of the work conducted is the identification of the main ways and methods to improve this indicator, primarily during the training of specialists in the professional education of the motor transport profile for teaching road safety. The main problems of training future specialists of this profile are investigated, in particular, the competence indicator is analysed. The use of modern innovative tools in the process of training future specialists is considered to overcome certain negative aspects. Features and prospects of digitalisation of the educational process are considered. The practical value of the results obtained lies in the fact that they provide an opportunity to improve the quality of knowledge provided in specialised disciplines and change the training system for higher education applicants in Ukraine

Keywords: professional development, labour market, information competence, multimedia, digitalisation

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INTRODUCTION

One of the main problems in Ukraine is the unsatisfactory state of road safety, which makes it necessary to ensure a high level of quality in the process of training specialists in the field of motor transport. In October 2020, the Cabinet of Ministers of Ukraine approved a Strategy for Increasing the Level of Road Safety in Ukraine for the Period until 2024 [1]. An important aspect to implement this Strategy is defined as human resourcing, which requires the training of future specialists who have a certain amount of knowledge and skills in the segment of traffic organisation and safety issues.

A group of researchers led by S. Reza emphasise that one of the areas of solving problems in the field of ensuring high-quality traffic activities is the introduction of intelligent management of the transport system, which would

allow for solving traffic problems simultaneously in several directions and monitoring road safety [2]. For example, the Euro Contrôle Route implements such activities in the European Union [3]. If a similar state body is created in Ukraine, a problem with providing the structure with highly qualified employees will arise. It would be appropriate to analyse the experience of European countries that have implemented an active and successful policy to reduce road accidents over the past 10 years to solve possible problems.

As A. Trifunović notes, an example of this experience is the policy of the Republic of Serbia, which has a similar level of GDP per capita to the Ukrainian indicator [4]. According to D. Pešić, the peculiarity of policy of Serbia is that it conducts highly qualified training of future specialists of the motor transport profile for teaching road

safety by introducing a wide range of different academic disciplines into the educational process [5].

At present, there is a problem related to the training of future specialists in the field of road safety in Ukraine. The educational process is conducted within the framework of a single speciality "Transport technologies (by types)". Therefore, the list of disciplines that are mandatory for bachelor's degree training consists of those related to passenger and cargo transportation technologies. The opportunity to correct this problematic aspect is provided by the Law of Ukraine No. 1556-VII "On Higher Education" [6]. According to the provisions of this Law, higher education institutions are allowed to independently choose and introduce specialities, determine their training programme and content. Therefore, higher education institutions can teach the specialisation "Road safety".

According to the Letter of the Ministry of Education and Culture of Ukraine No. 1/9-507, specialisations were introduced within the speciality "Transport technologies (by types)", among which "Transport technologies (in road transport)" is notable [7]. As noted by M. Song, due to such conditions, the permissible weekly training load on one of the future specialists decreases, which, in turn, leads to a reduction in the list of disciplines and the number of credits, especially selective disciplines of the curriculum [8]. Since there is not a single one in the list of mandatory disciplines of the speciality "Transport technologies" that would consider in more detail the problematic aspects of road safety, the introduction of such disciplines as selective is a rather complicated process.

Based on this, it can be argued that graduates of higher educational institutions in Ukraine in the speciality "Transport technologies" have a lower level of education in road safety compared to the bachelors of educational institutions in Europe. According to J. Shen, this aspect will have a negative impact on the quality level of planning and implementation of any national programmes and projects for traffic safety management [9].

Thus, the issue of investigating the main approaches to training future road transport specialists in teaching road safety in Ukraine, identifying the main problems and ways to overcome them is particularly relevant. One of the most important issues is the study of the prospects for introducing a separate specialisation into the educational process in the speciality "Transport technologies (by types)", which would be used to train highly qualified specialists in the field of road safety. The purpose of the study is to investigate the main ways to ensure professional education of motor transport profile, considering the needs of modern digital society. The scientific originality of the study can be defined as the selection of educational approaches with a focus on educational standards in the European Union countries.

MATERIALS AND METHODS

The conducted investigation, the field of which is the definition of methodological approaches in the training of specialists of professional education of motor transport

profile for teaching road safety, was conducted using various methodological approaches that cover the theoretical and practical aspects of this work. The theoretical approach helped to determine the main methodological techniques and methods in providing professional education for motor transport specialists. Due to the application of the functional approach, the effectiveness of modern methods of the educational process of students of motor transport profile was clarified; it was determined that now the intensity of the educational process and the activation of cognitive activity require new forms of training from future specialists, which provide an opportunity to learn big amounts of material in a short period of time; this is explained by the fact that today the amount of information and knowledge that students should possess has increased. The method of comparative analysis helped to identify the main reasons for the insufficient level of road safety in Ukraine compared to the European Union countries. Using the method of logical analysis, the main methods and techniques for improving this indicator were identified, especially when training specialists of professional education of motor transport profile for teaching road safety. The method of system analysis helped to investigate the main problems of training future specialists of this profile, in particular, the competence indicator was analysed; also, to overcome certain negative aspects, the use of modern innovative tools in the process of training future specialists was considered. The induction method uncovered the essence and prospects of introducing innovative tools into the educational process based on the described problems. Applying the method of deduction, based on the investigated problems related to providing professional education to future specialists of the motor transport profile, innovative ways to overcome these negative aspects were considered. Due to the use of the synthesis method, based on the identified results of theoretical and practical nature, the prospects for introducing innovative means of obtaining education into the educational process were determined, in connection with which it was determined that this provides an opportunity to increase the quality of education and change the system of training applicants for higher education in Ukraine.

The study was conducted in several stages.

1. The first stage consisted in covering the theoretical content of the work, namely, the main methodological approaches and methods in providing professional education for motor transport specialists were identified.

2. The second stage is based on the analysis of methodological approaches and their effectiveness; in this regard, the main reasons that serve the insufficient level of road safety in Ukraine compared with the level of the European Union countries, are clarified.

3. Due to the third stage, the main ways to improve the indicator of road safety in Ukraine were identified, including ways to overcome the considered problems, in particular, the introduction of innovative means of providing education into the educational process; it was determined that this provides an opportunity to improve the quality of

education and change the system of training applicants for higher education in Ukraine.

RESULTS

The process of training future specialists of the motor transport profile should be based on an in-depth study of the scientific foundations and technologies of the chosen type of area, the education of the necessary qualities of a moral, psychological, and aesthetic nature for future work, the development of special practical skills. Based on this, the determining level of training is technical education based on secondary general education; provides the development of professional knowledge, skills, and abilities; is provided by accredited vocational educational institutions; ends with the assignment of a certain level of qualification and obtaining a document confirming the acquisition of vocational education [10]. That is, professional education is the type of education that covers the knowledge, practical skills, and abilities that are necessary to perform work in the right field of work.

Now in Ukraine, there are urgent problems related to the modernisation of vocational training. Among the main factors, it is worth highlighting the political component, which is that in modern conditions Ukrainian education is part of the Soviet one, which focused on the training of the labour force, not qualified specialists; the financial component, which consists in the unstable state of financing the educational process, the low level of funding for science, which results in the destruction of scientific schools, the reduction of researchers, the insufficient level of remuneration for their work; the organisational and legal component, which consists in the active implementation of the main provisions of the credit-modular system in higher educational institutions, in connection with which, the educational process has become more complicated and the level of knowledge of students has become much lower; focus on general education, neglecting vocational and technical, since the cycle of professional and practical training is 4266 hours, while the cycle of humanitarian-social, general education and mathematical-natural training is 3926 hours (Fig. 1).

Load distribution over training cycles

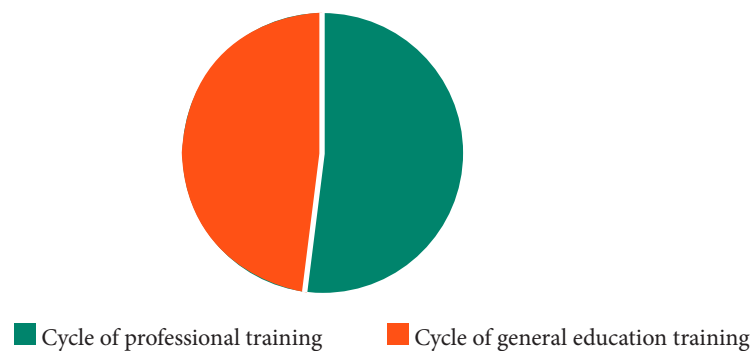


Figure 1. Load distribution over training cycles

Source: Standard of higher education in speciality 275 “Transport technologies (by types)” for the second (master’s) level of higher education [11]

Based on the above diagram, the cycle of general education training occupies approximately 48% of the educational process. According to these data, it is possible to assert the fact that the state of the educational process does not meet the modern conditions of demand in the labour market, since modern methodological approaches to training do not correspond to technological processes in enterprises.

Another substantial problem is the lack of focus in the educational process at universities on developing the competence of future specialists, namely knowledge, skills, and abilities to perform tasks. The consequence of this is a tendency to reduce the number of students every year. One of the ways to solve the problem is a competent approach to training future specialists of the motor transport profile. The basis of this approach is three components, namely: competence, expertise, and competence approach. In general, competence is a set of qualities of a business and personal nature, skills, and knowledge that provide the student with

the opportunity to act in the implementation of the obligations assigned to them successfully; it also serves as a range of powers of an official, within which he must have the necessary range of knowledge and is entitled to make responsible and adjusted decisions. Considering the concept of competence, it is worth noting that it is the ability of an employee to perform certain types of work professionally within a specific work activity while achieving successful and high results based on inherent skills and knowledge; it should also be defined as an existential property of a person, which is the result of their own human activity of a life-creating nature, initiated by the learning process [12]. In general, the competence approach is the one in which the results of education are defined as substantial outside of it. The introduction of this approach to the educational process is a key methodological tool for training future specialists, which provides an opportunity to build the content and goals of education in a different way, determine the results of training, increase the level of systematic professional

training of future specialists, and their readiness to solve the main tasks of social and professional activities.

Notably, in Ukraine, there is an insufficient level of ensuring traffic safety compared to the indicator of the European Union countries. Among the main reasons that serve this, it is worth noting such as a rather low percentage of road discipline of traffic subjects and awareness of the danger of the consequences of its violation; a low level of coordination of the activities of state bodies to solve road safety issues; insufficient level of practical ensuring the inevitability of punishment for violating traffic safety rules and the implementation of this by traffic participants; a low indicator of funding for measures aimed at reducing the occurrence of accidents on the roads; lack of consistency in approaches to analysing the effectiveness of current funding; insufficient level of use of modern methods of training and improving the skills of drivers, training in traffic rules of citizens; insufficient indicator of the effectiveness of a set of actions organisational, planning, and engineering areas, the purpose of which is to improve the organisation of traffic and pedestrians, and create safe traffic conditions, etc. [13].

The problem of low quality of professional training of drivers is one of the most urgent since qualified training of drivers guarantees safe driving. According to statistics, about 92% of road accidents occur due to disregard for traffic rules, which results in an increase in the death rate in Ukraine [14].

The issue of investigating future specialists of the motor transport profile for teaching road safety in more modern ways is of particular importance in overcoming this problem. For example, computer software products are the most effective for implementing the informatisation process for training drivers of motor vehicles. These include demonstration programmes that help illustrate certain objects, phenomena, or situations using traffic rules; training programmes that aim to develop and consolidate acquired skills, abilities, and knowledge; monitoring programmes that implement the function of controlling knowledge and skills, thereby saving teachers time and effort; reference programmes that provide quick access to additional information; programmes that can simulate phenomena and processes related to the operation and construction of cars and typical real-world cases that may occur for drivers with little experience [15].

Notably, the study of information and technical training tools by future specialists of the motor transport profile for teaching road safety is quite important, as it will help to activate the process of their work using a complex of audio, video, and multimedia textbooks and equipment. The use of these tools provides an opportunity to provide future specialists with a figurative perception of the material being investigated and its concretisation of a visual nature in the form that is most favourable and effective for processing and memorisation.

Due to the development of information and communication technologies, it is becoming possible to combine visualised learning with verbal methods, as, for example,

in animation classes, which can be applied even during distance learning. Now modern multimedia training programmes have been able to include the entire component of the theoretical driver training course using a fairly simple and accessible form – visualised. Situational modelling also serves as a substantial decision-making factor for future drivers, as it provides an opportunity to use various methods of solutions in conducting research and play different scenarios with any input data [16]. Notably, changing the development options and finding appropriate solutions provides an opportunity to increase motivation for training and develops the ability to assess road safety.

Distinguishing dynamic visualisation with elements of machine graphics and animation helps to increase the level of mental activity and substantially reduces the passivity of students. Models of familiar intersections through which driving training was previously conducted can be used to make the created situation more realistic. Using situational modelling methods and visualised demonstration tools allows switching to driving earlier on roads with high traffic intensity. The main means for the educational process in modern conditions are electronic textbooks, presentations, and internet resources.

The introduction of information and communication competence into the educational process is becoming a priority in modern education. Thus, the use of animation allows visually conveying the training material and also provides a perspective to look at the situation from different angles, show it in dynamics. During the implementation of the educational process of road safety, the main emphasis is placed on practical exercises, namely, mastering the correct technique for using controls, modelling possible situational events in theory classes, investigating first aid methods, practical driving, and maintenance. That is, the main goal of practical classes is to develop students' practical skills and abilities, using verbal, practical, and visual teaching methods.

Among other ways to improve the effectiveness of the educational process, future specialists of the motor transport profile should mention involvement in innovative forms of methodological work of collective and group, such as involvement in research activities, creative groups, pedagogical, or psychological trainings, forums for developing solutions to problems, methodological discussions, auctions, debates, business role-playing games, etc. The establishment of a flexible education system for the future teacher, which provides for an innovative approach of a specialist to improve the level of professional competence in the certification and inter-certification periods, and self-development, self-educational activities, and purposeful systematic methodological work is important [16]. An important aspect is the creation of an information and educational space with equal access of teachers and future specialists to information and educational resources, namely libraries, video libraries of pedagogical experience, media libraries, and a register of educational software tools. The readiness of the future specialist for innovative activities and the priority

of educational technologies is critical; in this regard, it is necessary to highlight the psychological support of educational activities, the development of a methodological basis for building a model of competence formation, the effective combination of theoretical and practical in the content of modules of educational programmes, the individualisation of the educational process based on the personal and professional potential of the teacher, the training of future specialists in technologies of competence formation, the creation of a reflexive environment that provides an opportunity for the development of subjects of the educational process. The motivation of students to publish scientific papers recorded in leading international scientometric databases provides an opportunity for specialists to be more competitive in the labour market.

The simulated situation requires urgent measures that will contribute to the radical improvement of the educational process system, including accelerating the process of creating a new training methodology, which will provide an opportunity to ensure the appropriate level of readiness of applicants for higher education of theoretical and practical content. It is important for future specialists to investigate the basics that will allow them to implement their work activities properly and efficiently, namely, to investigate the basic principles of conducting the training process for drivers. In addition, the use of modern information and communication tools in the educational process will not only reduce the number and severity of road accidents in Ukraine but also introduce qualitative changes in the educational process of applicants for higher education in motor transport for teaching road safety.

DISCUSSION

Events taking place in the modern world are increasingly characterised by a direct relationship between the information competence of subjects and their life. The changes that are formed in the creation of the goal of the modern educational process of a technical area are correlated with the goal of providing future specialists in the professional environment and their adaptation to it. This aspect is caused by a number of contradictions, primarily the educational requests of students in obtaining information of an educational and professional nature and the activities of the university, which are not sufficiently oriented to the needs of future specialists in the effective search for new sources of information.

It is necessary to improve and introduce into the educational process some methodological approaches aimed at developing the information competence of future specialists of the motor transport profile for teaching road safety to eliminate these problematic aspects.

As R. Elvik notes, information competence is one of the most important and contains a large number of components, namely: knowledge, skills related to ways to obtain new information, knowledge of modern information, and communication tools and technologies [17]. In modern conditions, the formally substantial paradigm has been

replaced by a personal activity paradigm, which is based on a competent approach. Therefore, the main goal of the modern training process is to help future specialists master various ways of activity that provide an opportunity to act with a focus on the position of a highly qualified specialist in a particular labour field.

Defining the concept of “information competence”, A. Toriumi notes that it should be distinguished as a combination of digital literacy, library communication skills, ethics, critical perception, technological literacy, and communication [18]. Analysing the papers of A. Gounaridou, he defines this as the quality of an integrative personality, which is the result of reflection of assimilation, selection, and transformation, enabling the production, making, prediction, and implementation of optimal decisions in various aspects of professional activity [19]. Depending on the development of information competence indicators, productive, reproductive, and professional levels are distinguished.

Analysing another category, namely personality-oriented learning, it should be defined as an educational environment where the main positions are placed on the self-value and identity of the student, uncovering first their subjective experience and subsequently coordinating with the content of professional education. In this area, the development of information competence is the embodiment of a complex system of variable activities, namely cognitive, informational, value-motivational, technological etc, in the process of implementation of which skills and abilities are developed that contribute to professional education and the establishment of the student's personality.

In general, the effectiveness of implementing information competence depends on the fulfilment of certain conditions. According to A.M. Ngoc, these include content, which consists in highlighting the components of the content of professional disciplines that are focused on the development of competence in the information area, focus on organising the process of mastering information aspects, developing and testing methods during classes on the auto department; organisational, the purpose of which is to familiarise future specialists with the tasks of activities on the auto department, conducting tests of initial, intermediate, and final nature to identify the levels of information competence among students and spread scientific experience; material and technical, for the implementation of which there should be a constant update of the material base of laboratories, the use of multimedia tools and the high-speed internet [20].

Providing a technological direction is teaching students how to operate in the information area, their introduction in the activity, which will contribute to the consolidation of the provided skills and the development of competence. Analysing the structure of information competence through the prism of an activity-based approach, it is worth highlighting such stages as the search, collection, and storage of Information; its perception, understanding, selection, and analysis; organisation of the obtained data and their presentation; creation of an information object

based on the internal representation of the student; communication; modelling; design; information management. In the process of developing information competence through a personality-oriented approach, a variety of technologies are used, namely the project method, the educational process in cooperation, multi-level, developmental, and problem-based training, STEM and mobile learning technologies, and attracting future specialists to extracurricular activities using digital technologies, etc.

During the educational process for future specialists of the motor transport profile, ready-made multimedia products, such as educational and methodological complexes, should be used for teaching road safety. According to F. Bin, the advantage of these complexes is that they contain methodological, control and diagnostic, alternative search, training, information-reference, and training blocks [21]. This provides an opportunity to explain new material by selecting graphic and textual material on various subjects, create an educational and didactic presentation, etc.; use multimedia tools to model and explain various situations that may occur during traffic; organise control over students' assimilation of educational material by developing independent and control tasks or tests; organise project activities, prepare students for creative and scientific competitions.

A necessary component in the course of training for students in this area is also the use of visual aids. As C. Sarango-Lapo notes, their advantage is that they allow consolidating and generalising the main material for students of different courses; contain auxiliary materials for investigating particularly complex subjects and performing experimental laboratory work; contain schemes and algorithms that provide an opportunity to process and remember educational material rationally; store additional information with a list of educational literature, scientific papers intended to provide information support for the subjects of the educational process and self-education [22]. That is, it contributes to the development of students' skills to organise, conduct, and implement the results of information-oriented activities, and to perform introspection and self-control.

The use of multimedia products and computer textbooks serves as a powerful tool for creating individualisation of the educational process, as it provides an opportunity for the student to form the ability to self-organise their activities from the acquired knowledge and skills and use them in practical activities. Examples of this type of multimedia products are lectures in video format, training in traffic rules in an interactive format, videos of physical phenomena, animated videos that illustrate various traffic situations, video experiments and tasks, digital encyclopaedias, practical tasks for independent modelling of various traffic situations, etc.

As H. Shim notes, an equally important means of forming such a crucial methodological approach in the educational process of future specialists of the motor transport profile for teaching road safety, as information competence, is the use of digital resources to search for new ways of data in the process of implementing project preparation and

research work [23]. This provides an opportunity to ensure the establishment of a common culture at a high-quality level and introduce new technologies to training, which contributes to social adaptation and professional development of future teachers in a modern digitalised society. Therewith, special attention should be paid to the development of their ethical attitude to the information provided by future specialists, the importance of preventing academic plagiarism and preserving the principle of academic integrity.

Thus, information competence as a modern methodological approach in the educational process serves as an integral means of training highly qualified future specialists. However, it is worth noting that one of the components of its implementation is the creation of a special educational environment. Further research work will focus on investigating the prospects for introducing new digitalised approaches to the educational process.

CONCLUSIONS

The results of the study demonstrated that now in Ukraine there is a problem with the lack of a separate specialisation in this area in institutes, in connection with which there is a low level of driver education and an increasing number of road accidents.

It was analysed that the current level of ensuring traffic safety in Ukraine is insufficient compared to the indicator of the European Union countries. The main reasons for this problematic aspect were identified; these include the low level of providing funding for measures that allow reducing the level of accidents on the roads, creating the safest traffic conditions, organising the movement of pedestrians and vehicles, the low level of coordination of state bodies in the field of solving road safety issues, insufficient level of discipline of traffic participants, and the realisation of the danger of the consequences of its violation, etc.

In the course of the study, a way to overcome this problem was identified, namely, the introduction into the educational process of more modern and digitalised ways of investigating road safety by future specialists of the motor transport profile. Computer software products are among the most susceptible to informatisation for training motor vehicle drivers. This enables the activation of the process of their work, which is implemented through the use of a complex of various tools. The use of these tools allows students to provide an opportunity to ensure an imaginative perception of the material being investigated and its concretisation of a visual nature in the form that is most optimal for investigating educational material.

An urgent issue is a study by students of the basics that will provide an opportunity to implement future work activities efficiently, namely, the study of the basic principles of the educational process for future drivers. It is worth paying attention to the use of modern digitalised tools in the educational process. This provides an opportunity to introduce effective changes in the educational process for applicants for higher education in motor transport for teaching road safety, and will also have a positive impact

on the severity and number of road accidents in Ukraine, namely, its reduction. These recommendations will have a positive impact on the current situation in Ukraine related to the number of road accidents.

Further research will be aimed at investigating the use of information and communication tools in the educational process of students of motor transport profile, identifying their main shortcomings and benefits.

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Методологічні підходи в підготовці фахівців професійної освіти автотранспортного профілю до викладання безпеки дорожнього руху

Анотація. Актуальність проведення дослідження зумовлено динамічністю змін усіх сфер діяльності, зокрема й автомобільної галузі. Мета цієї роботи – вивчити основні способи надання професійної освіти автотранспортного профілю з урахуванням сучасних потреб цифрового суспільства. Серед використаних методологічних підходів варто зазначити теоретичний підхід, методологічного аналізу, функціональний підхід, метод синтезу, метод дедукції, порівняльний метод та інші. У процесі дослідження визначено, що нині інтенсивність навчального процесу та активізації діяльності пізнавальної спрямованості вимагають від майбутніх фахівців нових форм навчання, які надають можливість засвоїти багато матеріалу в короткий проміжок часу. Обґрунтовано, що потреба в нових продуктивних підходах до навчання пов'язана з тим, що сьогодні зріс обсяг інформації та знань, якими повинні володіти студенти. Виокремлено основні причини, що призводять до недостатнього рівня безпеки дорожнього руху в Україні порівняно з країнами Європейського Союзу. Важливий аспект проведеної роботи – визначення основних способів та методів щодо підвищення цього показника, насамперед під час підготовки фахівців професійної освіти автотранспортного профілю до викладання безпеки дорожнього руху. Вивчено основні проблеми підготовки майбутніх фахівців названого профілю, зокрема проаналізовано показник компетентності. Задля подолання визначених негативних аспектів розглянуто використання сучасних інноваційних засобів у процесі підготовки майбутніх фахівців. Розглянуто особливості та перспективи цифровізації навчального процесу. Практична цінність отриманих результатів полягає в тому, що вони надають можливість підвищити якість надання знань з профільних дисциплін та змінити систему підготовки здобувачів вищої освіти в Україні

Ключові слова: підвищення кваліфікації, ринок праці, інформаційна компетентність, мультимедіа, цифровізація

UDC 159.922

DOI: 10.52534/msu-pp.8(3).2022.81-95

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The Concept of Zone of Proximal Development and its Derivatives: Problems and Prospects of Modern Interpretations

Article's History:

Received: 22.08.2022

Revised: 29.11.2022

Accepted: 28.12.2022

Suggested Citation:

Kolly-Shamne, A.V. (2022). The concept of zone of proximal development and its derivatives: Problems and prospects of modern interpretations. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 81-95.

Abstract. The study is devoted to the theoretical and methodological analysis of the concept of zone of proximal development, which is of great practical importance for education since it explains the mechanism of the influence of learning on the development of a student. Therefore, the purpose of the study is to analyse the current content and trends in the development of this concept and its derivatives. In this context, the classical ideas of L.S. Vygotsky on the zone of proximal development and the zone of present development, their indicators, and essential characteristics, including the evolution of the methodological status of the concept of zone of proximal development in psychology and pedagogy are analysed. Modern derivatives of the concept of zone of proximal development (scaffolding, zone of free movement, zone of prompted actions, zone of negative development, zone of variable development, zones of intermental development in the dialogue between teachers and students, etc.), its connections and correlation with these related and interrelated concepts are analysed. Based on the theoretical analysis, the psychological, didactic, and heuristic potential of the concept zone of proximal development is determined, in particular, its use as a methodological tool for developing projects in various fields of practice and branches of psychology. The latter is demonstrated by the example of student learning. The problem points and paradoxes of the modern understanding of the concept of zone of proximal development are also identified. The problem analysis is organised around the following subjects: the potential of the dual-plane zone of proximal development, the problem of its individualisation, the problem of social competence of interaction subjects that creates this zone, the zone of proximal development in the context of symmetrical-asymmetric learning and the quality of communication with peers in the group, the problem of the specific features of the zone of proximal development of an adult or an elderly person, the problem of moral competence and the inconsistency of the phenomenon of learning as a potential to change under external guidance. The obtained scientific results will be useful both for modern theorists of teaching and educating young people, and for teachers and psychologists working in educational institutions of various levels

Keywords: mental development, learning, L.S. Vygotsky, scaffolding, communication in the educational process, subjects of interaction

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INTRODUCTION

The global educational space of the 21st century is rapidly changing. This is primarily due to rapid transformational changes, globalisation processes, the spread of the Internet as a new form of communication, etc. These global changes lead to a transformation of the formats of modern education and upbringing. Accordingly, the assimilation of the socio-cultural experience of humanity by children and adolescents takes place in substantially new formats and contexts. Thus, *the problem of the relationship between mental development and learning* not only remains at the centre of the attention of psychologists and teachers [1; 2] but also encourages them to have a new vision and revision of current issues of modern education [3; 4; 5].

The essence of the relationship between learning and development is explained by L.S. Vygotsky through the concept of zone of proximal development (ZPD) [6].

N.N. Veresov emphasises that discussions on the cultural and historical theory of L.S. Vygotsky and the interpretation of the concept of ZPD, over time do not subside [7]. V.K. Zaretsky explains this by stating that, firstly, “the basic concepts that formed the basis of Vygotsky’s concept of development appeared only during the last 2-3 years of his life, so the cultural-historical theory should be considered as fundamentally incomplete” [8], and secondly, the concept of ZPD focuses on the main problem of Vygotsky’s concept – the relationship between learning and development. Therefore, the presented study aims to determine the theoretical and methodological content and main trends in the transformation of this concept in modern pedagogy and psychology. For this purpose, the following tasks were solved:

- 1) analyse the origins of the issue, the classical understanding of the concept of zone of proximal development, and its indicators;
- 2) reconstruct the evolution of the methodological status of the concept of ZPD in recent years;
- 3) highlight the problematic aspects and paradoxes of the interpretation of this concept in modern psychological-pedagogical research;
- 4) identify modern derivatives of the concept of ZPD, analyse its connections and correlation with these related and interrelated concepts;
- 5) determine the psychological-didactic potential and growth points of this concept;
- 6) using the example of teaching students to demonstrate the heuristic potential of the ZPD concept and the potential of its use as a methodological tool for developing projects in various fields of practice and branches of psychology;
- 7) popularise the idea of mental development and, in particular, the concept of ZPD, which focuses on the problem of the relationship between learning and development.

The discussion that follows is organised around **six subjects**: origins of the problem of ZPD in psychology; classical interpretation of the zone of proximal and present development in the theory of L.S. Vygotsky; modern understanding of the concept of ZPD in the papers of Western

psychologists; generalising interpretation of the main provisions on ZPD from the standpoint of their modern psychological-pedagogical importance; evolution of the theoretical status of the concept of ZPD and the emergence of its derivatives, and the relationship between the concepts of ZPD and derived concepts, problems, and paradoxes of modern understanding and interpretation of the concept of ZPD, in particular, the problem of blurring its content and volume, and modern examples of using the concept of ZPD in teaching students of higher educational institutions. A systematic analysis of these subjects in the totality of their interrelations and mutual influences is a scientific originality of this study.

ORIGINS OF THE PROBLEM AND IDEAS OF L.S. VYGOTSKY

The problems of correlation between development and learning in psychology are presented in the following main approaches [9]:

- development and learning are independent processes;
- learning is actually the development itself, these concepts are synonymous and can be understood as the development of conditionally reflex connections or as the establishment of associations and skills;
- learning is an external condition for development, as it builds on development with maturation;
- learning goes ahead of the development and contributes to the emergence of mental neoplasms in it.

Ukrainian and Western researchers believe that the last of these approaches is the most productive and substantiated. The main ideas of this approach are laid down in the papers of Lev Semenovich Vygotsky, one of the key figures in the psychology of the 20th century. He developed the original theory of the relationship between the mental development and learning of a child [1; 6; 10]. The problem of child development was the passion of L.S. Vygotsky and in the last years of his life, most of his scientific papers were connected with this central issue [11]. The concept he created is far from easily accessible. However, despite this, it remains the subject of considerable attention from researchers and encourages them to review and solve current issues of modern education [3; 5].

As noted by the author [12], L.S. Vygotsky shared the concern expressed by Zh. Piaget, regarding the relationship between development and learning: when a teacher offers new learning content, they must consider the current level of development of the child, that is, the structures based on which the child will assign this new content. However, the goal of the brilliant project of L.S. Vygotsky was to define higher mental functions as cultural entities and suggest another requirement for learning: good learning is learning that goes ahead of development [2; 10].

Vygotsky needed to explain the complex relationship between learning and development without going back to the reductionist concept of development. Complex forms of conscious activity (writing practice, various procedures for solving arithmetic problems, etc.) were developed historically by

mankind and objectified by it in culture in the form of papers, tools and instrumental systems [12]. The child must rebuild these forms of activity to re-assign them, meeting the expectations of adults and in cooperation with them [2; 13; 14]. Thus, learning is interpreted in Vygotsky's theory as a process of transmitting to the child the socio-cultural experience of humanity, which is ahead of its development, stimulates this process, creates a long-term development plan, while relying on the current level of development of the child [12]. The essence of this relationship between learning and development is explained by L.S. Vygotsky through the concept of ZPD.

CLASSICAL INTERPRETATION OF ZPD IN THE THEORY OF L.S. VYGOTSKY

The concept of zone of proximal development was extremely important for the development of the cultural and historical theory of mental development, moreover, according to V.K. Zaretsky, the concept of ZPD was its core and epicentre [8, p. 38]. The main idea is that the phenomenon of the zone of proximal development radically distinguishes humans from animals [15]. The animal learns by training,

while in children the main thing is development through cooperation and imitation through school education, which is the source of all specifically human properties of consciousness [15, p. 355]. This means that learning is not a simple accumulation of conditioned reflexes, as in animals, but a fundamental driving force that encourages the development of processes that would not have been possible without it. That is why, according to modern researchers, the ZPD is the intersection point between the child and their socio-cultural environment [16; 17].

In the classical sense, the child's ZPD is interpreted as the distance between the level of its present development (it is determined through tasks solved by the child independently) and the level of its potential development (it is determined through tasks solved by it under the guidance of an adult) [6, p. 399-400; 12] (Fig. 1). Conventionally, ZPD is understood as something that the child does not know how to do on their own but can learn with the help of an adult who directs the child's activities, or more competent partners-children [12]. Thus, learning organised based on properly organised assistance (mainly from an adult) goes ahead of development and leads it [18].

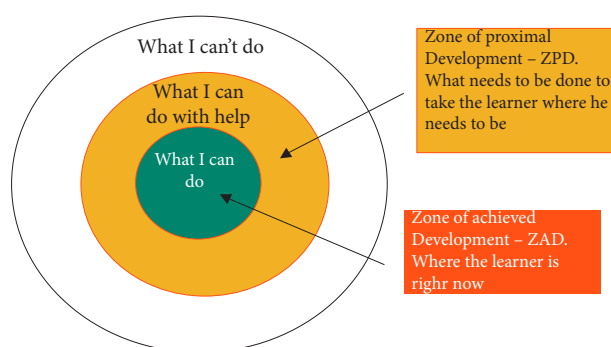


Figure 1. Schematic image of the ZPD

Source: [19]

In other words, in this process, *two levels of a child's mental development* interact:

- the first is *the level of present development*, within which the child independently, without the help of an adult, uses the acquired knowledge, skills, and abilities to solve practical problems;
- the second is *the level of proximal development*, within which the carrier of socio-cultural experience is an adult, in cooperation with whom the child gradually learns to solve the tasks set.

Based on the generalisation of theoretical achievements of L.S. Vygotsky and his followers, researchers [9] determined the indicators of the zone of current and proximal development of the child.

Indicators of the level of present development of the student are:

- *learning ability*, i.e., the student's knowledge, operation of separate isolated learning actions, skills;
- *development* of mental abilities, i.e. (1) the presence of formed educational activities, in particular, independent

definition of tasks, creation of generalised guidelines in educational activities, its variability, realistic self-assessment in this activity, and (2) characteristics of mental development, in particular, abstract and dialectical thinking, the ability to interiorise, internal action plan, possession of such operations of thinking as comparison, analysis, synthesis, abstraction, optimal qualities of the mind;

- *good manners*, i.e. the child's moral knowledge and beliefs, their motivation to learn, goals and emotions in learning, moral actions in behaviour and learning, consistency of knowledge, beliefs, and behaviour.

Indicators of the zone of proximal development of the student are:

- *learning ability*, i.e. the ability to learn new knowledge, the speed of formation of new concepts and methods of educational activities, the ability to perceive and process new information, receptivity to the help of others, activity and speed of orientation in new conditions, the ability to transfer the acquired experience to new conditions, to switch from one method of educational work to another, pace, performance, endurance;

- *development* of mental abilities, in particular, the response to the urge to further cognitive development that occurs externally, switching from one plan of mental actions to others;

- *good manners*, i.e. response to external motivation for personal development, orientation activity in new social conditions, flexibility of behaviour, transfer of behaviours to new conditions) [9].

According to the concept of L.S. Vygotsky, teaching a child what they are not able to learn, as it does not rely on the zone of their present development, is just as useless as teaching them what they can already do on their own. Therewith, the basis of learning should be the *active* involvement of students themselves in the process of acquiring knowledge, gradual development in cooperation with adults of the ability to independently acquire knowledge. Thus, the defining component of a child's development in the process of learning activities is the assimilation of knowledge, methods of activity, objects, and ways of using them, which cannot be discovered by a child without *cooperation* with adults [12].

MODERN UNDERSTANDING OF THE CONCEPT OF ZPD IN THE PAPERS OF WESTERN RESEARCHERS

As noted by the authors (for example, [8; 20; 21]), interest in the theoretical development of the concept of ZPD has recently been constantly growing. According to N. Veresov, it retains the status of one of the most used by Western (primarily English-speaking) researchers [7]. The first thing they correlate to the name Lev Vygotsky is the concept of the zone of proximal development [8; 15; 22]. N. Veresov estimated that the number of publications devoted to ZPD is constantly growing. For example, over the past 5 years, Web of Science alone has offered 215 studies, not to mention Scopus, PsycInfo, and PsychLIT [7]. A.A. Margolis, who has analysed the indicators of publications related to ZPD in various research databases over the past 20 years, also recorded their continuous growth. The author notes that the number of publications in Web of Science increased from 10-20 to 70-90 per year, and the Russian scientific citation index (RSCI) recorded an increase from 1-2 publications in 2002-2003 to almost 500 in 2019 [23].

Some researchers question the place of the concept of ZPD in the theory of L.S. Vygotsky and substantially reduce the meaning of this concept [24]. However, despite criticism, this concept continues to gain popularity in modern Western psychology and pedagogy. As G. Wells notes, a substantial part of modern Western researchers adhere to the classical understanding of ZPD [25]. They interpret ZPD as an emerging, open, reciprocal trait of the student [25], as a place where learning and development intersect [26]. M. Shokouhi, N. Shakouri emphasise that "Vygotsky was right in his definition of the concept of ZPD as a zone beyond which a child can move from their current to the potential level of development" [27, p. 63]. According to W.E. Dunn and J.P. Lantolf, ZPD is a "dialectical unity of

development and learning, in which it is learning that determines the leading path of mental development, which, in turn, prepares the basis for further learning" [28, p. 422]. J. Valsiner and R. van der Veer emphasise that the concept of ZPD, which was developed by Vygotsky in the context of the instrumental method, emphasises the importance of reducing the distance between the past and the future, social facilitation, play, fantasy, and social interaction in the process of internalisation as the assimilation of new experience by a child [29, p. 39]. The authors, simultaneously, discuss the so-called methodological paradox, which Vygotsky proposed through the concept of ZPD. It is stated that by acting through learning in the present, the ZPD focuses on near or future psychological functioning. Thus, a direct empirical study of ZPD is impossible, since it can only be detected retrospectively when future abilities become a reality [29].

H. Daniels, in turn, interprets the concept of ZPD as a scientific attempt to understand the effect of the contradiction between the internal capabilities of a child and external needs, which is the driving force behind its development. According to H. Daniels, the concept of ZPD was created by Vygotsky as a metaphor to help explain the way in which social and collaborative (participatory) learning occurs, highlighting the general genetic law of cultural development that asserts the primacy of the social in development. He assumes that L.S. Vygotsky sought to develop a theoretical concept that would explain the nature of man as creating themselves from the outside [21].

Some Western researchers believe that ZPD is the most well-known and popular part of Vygotsky's theory that can be effectively used in learning [30]. However, as noted by N. Veresov, the situation with understanding ZPD as a concept that explains the development issue, has not changed recently. As before, English-language literature is dominated by either arbitrarily fragmentary or simplified interpretations of this scientific construct [7]. The concept of ZPD is often interpreted incorrectly or remains unclear at all. N. Veresov makes a reasonable conclusion that it remains in Western science a concept that, in comparison with others, is most often used, but simultaneously the least understood [31].

GENERALISING INTERPRETATION OF THE MAIN PROVISIONS ON ZPD FROM THE STANDPOINT OF THEIR MODERN PSYCHOLOGICAL-PEDAGOGICAL MEANING

The growing interest in the concept of ZPD is associated with the prospects for its application in practical work, in particular, attempts to build specific types of educational practice based on the idea of ZPD [8; 20; 21].

The modern understanding of the concept of ZPD is connected, on the one hand, with new practices of the pedagogical process as cooperation between a child (group of children) and an adult (teacher), on the other – with the interpretation of teaching as a *reflexive-activity process* of understanding educational tasks and strategies for solving them. The well-established provisions on ZPD have recently acquired a new understanding in the papers of

E.E. Kravtsova [14], G.A. Zuckerman [16], V.K. Zaretsky [8; 32], I.A. Kotlyar [33; 34], and other Ukrainian [35; 36] and Western [37; 38] researchers. Based on these papers, it is possible to provide a generalising interpretation of the basic provisions on ZPD from the standpoint of their modern psychological-pedagogical meaning. These main theses reflect the *didactic* value of the idea of L.S. Vygotsky, based on which, it is possible to distinguish practical pedagogical procedures that will contribute to the development of the child in the learning process, and not only explain the functioning of some mechanisms of the appearance of neoplasms in development. Modern *psychological-didactic understanding of the concept of ZPD* was summarised by the author in previous studies [12] in the following provisions:

1. ZPD is directly related to the processes of learning and mental development, learning should focus on ZPD, somewhat *exceeding* the available cognitive capabilities of children.

2. According to the mechanism of implementation of the ZPD, it manifests itself in *imitation* and its special form – *cooperation*, and in this capacity, it is connected with the process of acquiring auxiliary, cultural means by the child.

3. The boundary between the area of present development (i.e., what is currently available and can be independently implemented) and the ZPD is the first *difficult task*, which the child is not able to perform independently, when they need the help of an adult.

4. If the child is not able to complete the task (action), they find themselves in a *problem situation*, that is, they cannot do what needs to be done on their own. Cooperation between a child and an adult when learning within the ZPD is conducted in a problematic situation, which the child can fulfil with the help of an adult.

5. In the course of a child's mental development, there is a constant contradiction between two aspects of their activity – motivational and operational. ZPD is a psychological space for resolving this contradiction.

6. ZPD is a special form of interaction in which the action of an adult is aimed at generating and maintaining the *initiative action* of a child. The interaction of the ones who can and know with the ones who do not is an abbreviated form of joint action that can create a ZPD. A developed form of such interaction is the *cooperation of equal*, but different, represented in the relationship between an adult and a group of children. The real dynamics of these relationships are determined by their emotional-semantic unity.

7. Development acts as a process of transition from the joint performance of complex but accessible tasks to the child, to their independent performance (without the help of an adult). This transition is *the measure of the effectiveness of help* of an adult: if the child becomes able to do independently what yesterday did only in cooperation with an adult, then the help was effective. If this does not happen, the adult should rethink what methods of assistance and how they use them.

8. ZPD is an area bounded on two sides: on the one hand, the border runs where the child is able to successfully act independently, on the other – where they cannot successfully act even in cooperation with an adult. In other words,

the ZPD area has a border beyond which lies the zone of current inaccessibility, that is, what a child cannot do even in cooperation with an adult. Thus, there is both a lower threshold and an upper threshold of learning, and only in this interval lies the *optimal period* of learning certain subject content.

9. the ZPD area is formed by actions that the child can *understand*, but is unable to perform, that is, it is a zone within which the child acts intelligently and meaningfully with the help of an adult. If they cannot interact meaningfully, cooperation cannot be implemented. Therefore, the role of activity-reflexive processes is decisive here.

10. The diagnostic potential of ZPD lies in the possibility of *measuring* the level reached by the child when they solve problems not by themselves, but together with an adult, and thereby determines the possibilities of transition from what the child can do to what they do not. ZPD is the leading methodological technique in the diagnosis of children's mental development and the study of their individual differences.

11. The concept of ZPD can also be extended to other aspects of the individual (not only mental development).

EVOLUTION OF THE THEORETICAL STATUS OF THE CONCEPT OF ZPD AND THE EMERGENCE OF ITS DERIVATIVES

L.S. Vygotsky had very little time to demonstrate the potential of the ZPD concept to implement his ideas, so it is not surprising that the debate about this concept has not subsided to this day. Due to Vygotsky's brilliant inspiration, the concept of ZPD is a construct that is constantly developing [27, p. 63]. However, it is often sought to be applied in contexts that go beyond its classical understanding, in particular, within the framework of the child's intellectual development (for example, [39; 40]). That is why, despite the presence of classical, well-established provisions, in modern psychology and didactics there are numerous *paradoxes* in the understanding and interpretation of the concept of ZPD.

H. Daniels notes that in recent years, concepts have emerged in science that are *derivatives* of the classic ZPD construct proposed by Vygotsky but have different conceptual accents and connotations. The process of emergence of new concepts, in his opinion, is due to the following factors: (1) the growing interest of researchers in the concept of ZPD, (2) the possibility of its application in educational practice, (3) the impossibility of its unambiguous and direct operationalisation [21]. These derived concepts include:

- the concept of scaffolding – assistance to a student originating from an adult [41];
- Zone of Free Movement and Zone of Prompted Action [42-44];
- Zone of Negative Development [45-48];
- Zone of Variable Development [45];
- Intermental Development Zone, which arise through the dialogue between the teacher and students [42; 49; 50];
- multiple zones of proximal development of children of different ages in a single community of students [51; 52];

- Zone of Free Movement (ZFM) [42];
- the Fifth Dimension of M. Cole, etc. [21].

In this study, the first three constructs that are the most commonly used and operated in psychology and pedagogy: Scaffolding, ZFM-ZPA and Zone of Negative Development are analysed in more detail.

THE CONCEPT OF ZPD AND SCAFFOLDING

Recently in psychology, quite often the *reduction of the concept of ZPD* is observed, associated with an attempt to interpret it exclusively in the context of didactics. This trend is present in the papers of foreign researchers in various disciplines and one of the manifestations of this trend can be considered the concept of *Scaffolding* (for example, [53; 54]).

Notably, the concept of scaffolding and the zone of proximal development, which occupy a central place in western psychological-pedagogical research, have been interpreted for many decades as interrelated and sometimes, identical [27; 51].

The concept of scaffolding was introduced by J. Bruner [41]. He describes scaffolding as:

– educational and cognitive support that teachers provide to students to help them solve problems that they cannot solve on their own;

– as a form of vicar consciousness (vicar learning), in which students go beyond themselves through involvement in the teacher's consciousness.

D. Morgan and P. Skaggs explain the relationship between the concepts of scaffolding and ZPD this way. Scaffolding offers temporary and flexible support that can be quickly and easily assembled and disassembled after completing a learning task. As a result, the student's ZPD expands, and the support is moved to the edge of the new learning boundary. Giving students the most difficult tasks that they can complete with minimal resistance is the best way to succeed in learning [55]. M.E. Poehner, J.P. Lantolf give an interesting example of the differences between these concepts. In their opinion, scaffolding involves engineering efforts of *expert advisor* to offer something to students, help, and with the phenomenon of ZPD, an analogy of gardening can rather be drawn, which requires the gardener to pay equally close attention to those plants that have already given fruit and flowers and to those that have only buds and change their activities accordingly. Consideration of what is not yet there, but could be, if properly cherished, is, in their opinion, a crucial feature of Vygotsky's conceptualisation of ZPD [26, p. 32].

According to most Western researchers, scaffolding reflects the assistance that an adult provides to a child in the process of cooperation [27; 52]. In other words, scaffolding consists of actions, instructions, tools, and resources to complete a new task or master a new skill. Help gradually decreases as it becomes unnecessary. After that, the student will be able to complete the task independently [56].

C.A. Stone, who thoroughly investigated the meaning of the metaphor of scaffolding [57, p. 345], defends this metaphor, providing certain arguments. However, simultaneously, he believes that it adds little to the original concept

of ZPD [57, p. 351]. The most substantial criticism is based on the following argument: this metaphor cannot generate any new ideas, because scaffolding is a static object [58]. The metaphor of scaffolding is static, so it does not reflect the dialectical connection between beginning and development. According to J. Xi and J.P. Lantolf, the concept of ZPD is deeply dialectical, so the static concept of scaffolding weakens the power of Vygotsky's theory [59].

Some English-speaking researchers, on the contrary, interpret the term scaffolding as conceptual and introduce the metaphor of scaffolding into the status of the theoretical concept [60]. Therewith, a comparative analysis of the content of the concepts of ZPD, teacher activity, learning ability, scaffolding [7; 23; 61], and a thorough analysis of Vygotsky's texts and interpretations of the concepts of ZPD and scaffolding in the English-language literature led to a number of critical comments on the identification of these concepts. Thus, N. Veresov notes that this identification deprives the ZPD of its essential content [7]. J. Xi and J.P. Lantolf argue that any of these identities is partial at best and superficial at worst [59]. The general opinion is that the concept of ZPD was proposed by L.S. Vygotsky in the context of analysing the child's mental (mainly cognitive) development and therefore cannot be adequately understood outside of this general context [23; 37, p. 45-46]. The main argument against this identification can be the understanding and interpretation of the child's development in play and through play as a form of symbolic reflection and transformation of reality [59; 62].

THE CONCEPT OF ZPD AND ZFM-ZPA

J. Valsiner [43] notes that some examples of the use of the concept of ZPD in western psychology simply served the purpose of designating complex phenomena with an equally complex concept. He believes that the concept of ZPD itself does not bring substantial clarity or understanding to the problem of linking development and learning, so he reconstructed the concept of ZPD as a system of zones that goes beyond its classical ideas, in particular:

a) a zone of free movement that is available to the child now and corresponds to the level of its current capabilities (Zone of Prompted Action – ZPA);

b) zones of prompted actions and activities, that is, those that do not require the child to them perform mandatory, are not associated with any consequences for the child in case of disagreement, and are encouraged by adults in a sufficiently free form (Zone of Prompted Action – ZPA).

Later J. Valsiner and P.E. Hill suggested considering them as interrelated concepts [44]. According to J. Valsiner & R. Van der Veer [63; 64], ZFM structures a child's access to different areas of the environment, to different objects in these zones, and to different ways of influencing these objects. The boundaries of ZFM are those parts, where it is constantly either restored or redefined. ZFM is a variable structure of adult-child relationships with the environment that guides (outlines boundaries but does not strictly define) the development of child actions in the areas that are

expected in a given culture. Thus, ZFM is a socially built cognitive structure of the child's relationship with the environment. It is socially built because it is based on the system of meanings of adult representatives of culture and because it is the result of interaction between an adult and a child. It is a cognitive structure because it organises the relationship between the child and the environment based on the knowledge, beliefs, and meanings used by cultural representatives in activities. Therewith, ZFM is to some extent a braking mechanism. Its function is to *restrict* a child's actions in a specifically structured environment.

ZFM has subzones that further organise the child's relationship with the environment. One of these zones – Zone of Prompted Action (ZPA) – is an action promotion zone in which the caregiver (adult) tries to promote certain actions of the child with certain subjects. The child can but is not required to comply with the adult's requirements and respond to their efforts. If the child does not follow the instructions, adults should not take any penalties or restrictive measures. This contrasts with the behaviour of an adult when a child *crosses the boundaries of ZFM* when an adult acts to restore or redefine existing boundaries. Van der Veer & Valsiner emphasise that ZFM and ZPA are mechanisms by which the child's degrees of freedom of action are selectively regulated in the environment of the social and subject environment. Their special organisation channels the child's actions in certain areas [65]. In another paper, D.C. Holland and J. Valsiner [66] argue that the concept of ZPD by L.S. Vygotsky is closely associated with ZPA (zone of present development).

They offer three different analogies. *Firstly*, parents can suggest action patterns at a time when the child is just starting to perform them in cooperation with the adult; in this case, ZPA coincides with ZPD. *Secondly*, parents may try to promote certain patterns of the child's actions at a time when the child's developmental history has not yet prepared them. In this case, ZPA and ZPD do not overlap. *Thirdly*, parents may choose not to encourage or allow certain activities that the child might have performed with the help of others. In this case, the ZPD is located outside of ZFM. If the ZFM limit is not reconfigured to include a set of actions in the ZPD, then the parental socialisation strategy eliminates the possibility of developing skills in the child in these possible but unactualised actions.

ZPD AND ZONES OF VARIABLE AND NEGATIVE DEVELOPMENT

In the context of modern approaches to group learning and understanding the mechanisms of spontaneous socialisation, the concept of zones of variable development is of interest. This refers to zones that arise when a child interacts with other children of different ages and subcultures in the absence of direct control from adults [45; 52]. According to the author, the concept of zone of variable development opens up new prospects for analysing the developmental interaction not only between a child and an adult but also between children in a group.

Another interesting idea of a development zone that suppresses and delays development is designated as a “*negative development zone*” [45-48]. American researchers, for example, describe areas of negative development that are created by the biased attitude of the US school teachers towards students representing national minorities [46]. A.N. Poddyakov introduces the concept of zones of negative, suppressed development that arise in conditions of ineffective adult help. This is something that the subject could have learned and developed in themselves, but did not as a result of various reasons, for example, erroneous adult help, pedagogical errors, etc. This phenomenon also takes place because any learning and assistance is not only progressive development, but also limiting and cutting off certain ways of development [46].

Thus, modern authors make a certain contribution to the concept of ZPD as an addition to Vygotsky's concept. This allows moving from a real understanding of the ZPD concept to a potential level, which can be implemented as IDZ, ZFM, and ZPA. The future fate of the ZPD concept will depend on how new proposals (such as IDZ – Intermental Development Zone, ZFM, and ZPA) can serve as both potential levels for their participants and levels of present development for others, through which other opportunities can be realised.

PROBLEMS AND PARADOXES OF MODERN UNDERSTANDING AND INTERPRETATION OF THE CONCEPT OF ZPD

Based on the preliminary analysis, it can be emphasised that the blurring of the content and scope of the classical concept of ZPD is the main problem. The author agrees with G.A. Zuckerman's opinion that the vaguer and more amorphous a concept becomes, the less explanatory power it has [16], and the more it may weaken the importance and stability of Vygotsky's theory in general. According to R.D. Pea [60], the concept of ZPD becomes too broad in its meaning, too blurry, and therefore loses its potential [60, p. 423].

Multiple ZPD interpretations give rise to other numerous **paradoxes and problematic issues** which do not have an exhaustive answer but are worth paying attention to for researchers and practitioners in further didactic research in modern transformational conditions. In other words, how and in what aspects the concept of ZPD can allow for improving and transforming pedagogical practices that are rapidly changing, adapting learning and upbringing to new conditions.

The first problem consists in the potential two-plane nature of the ZPD phenomenon. L.S. Vygotsky [15] believed that the concept of ZPD can be extended to other aspects of the individual. In other words, the potential of the classical concept of ZPD lies in the fact that it characterises not only the mental development of the child. According to M.S. Veggetti, it includes purely cognitive, motivational, and emotional content [67]. In the cognitive aspect, it reflects a certain amount of knowledge that the student cannot build (find, deduce) themselves, but is able to assimilate

if they are obtained from another, more competent subject based on the knowledge and strategies already available to the student. In motivational and emotional terms, the concept of ZPD reflects a focus on a significant other, someone who is respected for possession of the material, and possibly respected and loved as a person in general, a willingness to accept part of their values, follow this person and obey their guidance (at least within the limits sufficient for the success of assimilation) [33].

M.R. Ginzburg emphasises that changes in the zone of proximal development are a logical consequence of the transition from joint activities of a child with an adult to activities that are conducted individually. In his opinion, “in the present development of the child, the motivational component has already been removed, and the operational component has already been mastered. In the process of developing a new ability, both of these components work, thereby determining the zone of proximal development. Both in the absence of a motive and in the complete absence of appropriate operational mechanisms, it makes no sense mentioning the zone of proximal development” [36, p. 148].

Thus, the rhetorical question of whether someone who is not a reference and an insignificant person can teach takes on a special emphasis. It brings the study back to the role of the teacher in the development of value-semantic formations of personal and cognitive development. The second rhetorical question – is it possible to teach someone who does not want (is not ready) to learn – turns into a problem of forming internal motivation and leads back to the concept of ZPD in the aspect of not only operationalising the content of learning and its methods (how? in what way? by what means?), but also in the aspect of the adult’s ability to contribute to the development of intrinsic (internal) motivation for the activity.

M. Levykh emphasises that ZPD can successfully promote learning and development only when it is understood and used in the context of a holistic concept of cultural development, which provides for a three-way relationship between emotions, possession of behaviour, and personality, for example, in his doctoral dissertation on “Personality, emotions, and behavioural mastery in the thought of Lev Vygotsky” he analyses in detail the relationship between the concept of cultural development, socio-cultural, and historical context of development, human emotions, personality, possession of their behaviour, and the application of these concepts in the educational environment [68].

The second problem is associated with factors of individual variability of ZPD in different people. The question of the sources and determinants of the zone of proximal development does not have an exhaustive answer [69]. Why does it vary so much for different children? What exactly does it characterise in development, an indicator of what preliminary events and processes occur in the current situation? Admittedly, there is every reason to talk not about one zone of proximal development in a particular person, but about the fact that both children and adults have many different zones of proximal development. Moreover, a

person in relation to certain content may have a substantial zone of proximal development, while in relation to other content or other forms of activity, a person (in the context of ZPD) may be incompetent and need substantial external help. G.A. Zuckerman rightly defines ZPD as “a space of potential development opportunities, supported by educational interaction or not” [16, p. 65]. Individualisation of mental development as its expressed feature brings the problem of learning as a space for realising unique potential opportunities for each child back. “The teacher will thus assume the role of a development agent” [70].

The third problem consists in determining the level of social competence of the subjects of interaction that creates the ZPD. It is part of the problem of communication and interpersonal relationships in the educational process. The concept of ZPD in the concept of L.S. Vygotsky was developed in the context of a predominantly microsocial level of analysis – the level of the closest interpersonal relationships and paired, dyadic teacher–student interactions. An important aspect of care that an adult (experienced *other*) provides in the zone of proximal development is connected with the communication of two subjects of interaction. The interaction of a child and an adult actually creates a ZPD.

However, to respond to the teacher’s request (informational, problematic, communicative, etc.), the child must have communication skills at the appropriate level (for example, *be able to* ask for help, accept help, etc.) and it is necessary that the student *wants to* accept this help (for example, had a desire to make contact, desire, interest to get this help). According to G. Kravtsov and E. Kravtsova, the scope of the zone of proximal development is directly related to this aspect [1]. In other words, a small zone of proximal development or even the absence of any subject and operational content in the zone of proximal development can be associated not only with problems of a subject nature, but also with communication difficulties. Thus, the ZPD is defined as both the social competence already achieved and the social competence that develops in the learning process.

In this regard, it is extremely productive that the ZPD is actually defined and described not in the language of the content of tasks, but in the language of *types of assistance*, which to a certain extent helps the child to solve the problem [14; 16; 25; 71]. It is the types of assistance (types of interaction) that are the typology of learning, within which the question of where learning leads to development can be honestly answered [16, p. 66].

The fourth problem can be defined as a problem of the content and quality of communication between two subjects of interaction, which creates a ZPD. American researchers on the example of learning a foreign language show that the contradiction between the current abilities of the student and the requirements of the educational task is solved through communication and cooperation between two subjects of interaction – the intermediary (adult) and the student (M. Poehner, J. Lantolf) [26].

If the interaction of a child and an adult creates a zone of proximal development, this brings up the question

of whether it is possible to learn from a teacher (an adult in general) who is not liked and causes negative emotions (for example, fear, aversion). Is it possible to have the desire to ask for help and accept it, to understand the desires and requirements of such a teacher? Thus, the quality of communication and, in the context of this, the personality of the teacher themselves is of unmatched importance in the process of implementing the ZPD resource. The teacher is a symbolic chain between the past and the future, between the ZPD resource and the child's current ZPD resource. In the context of socialisation in general, it can be stated that the teacher implements the connection between the resource of modern human culture and modern childhood culture. This vision brings the attention back to the role of the teacher in the development of value-semantic formations of personal and cognitive development, and further – to the problem of compatibility of teachers and students in educational interaction. According to the author, it makes sense to assume the presence of different levels of compatibility (or incompatibility) – perceptual, communicative (discursive), value, which at different stages of interaction contribute to the development of the child or, conversely, inhibit it.

Recent ideas about the development of Vygotsky's concept suggest that people learn from others not necessarily because they are more competent, but because they think differently. N. Mercer, based on the concepts of scaffolding and ZPD, in a series of papers [42; 49; 50] proposed his own concept that explains how interpersonal communication can help human learning and intellectual development. This concept is based on the concept of the intermental development zone (IDZ). According to him, this concept aims to explain the way in which the interactive process of teaching and learning is based on maintaining a framework of context or shared knowledge created by participants through language and joint actions. This contextual frame supports the mutual orientation of participants to a common task; and in the case of productive interaction between teacher and student, this frame will be precisely tuned to increase the student's understanding as they progress in learning activities [42].

According to N. Mercer [50], the concept of IDZ also explains the nature of the communication process in which the so-called vicarious consciousness and the concept of scaffolding by J. Bruner are realised. Unlike Vygotsky's original proposal, IDZ is not a characteristic of individual abilities, but rather a dialogical phenomenon that is created and maintained between people in joint interaction. He emphasises that IDZ embodies the following requirements, which can be related to symmetric and asymmetric teaching and learning:

- 1) any joint, purposeful task should include the creation and maintenance of a dynamic contextual framework – the framework of joint knowledge and understanding;
- 2) the use of language in joint activities creates this framework and simultaneously depends on the creation of this contextual framework;
- 3) the success of any joint attempt will depend on the

feasibility of communication strategies that participants use to pool their intellectual resources.

In addition, one of the important techniques that can be used to develop speech and thinking is to use existing ideas to move on and form new ones. N. Mercer noticed a consistency in how conversations are used as a tool for developing thinking. He notes that teachers often use the following techniques:

- Summary – analysing what the other person has already experienced, and then preparing the basis for further development.
- Elicitation – questioning and encouraging the other person to remember what they already know and possibly think about it.
- Reformulation and repetition – a technique of paraphrasing what was said to clarify and emphasise the idea.

It is interesting that through these techniques, it is possible to pull out ideas, and not impose own ideas on another person. These techniques encourage ideas and allow people to think out loud and develop conceptual understanding using a form of linguistic scaffolding through IDZ construction.

N. Mercer [50] offers a metaphorical image of IDZ as a kind of bubble, in which the teacher and student move through time. IDZ is a dynamic, reflexive support of a purposeful, shared consciousness of teacher and student, focused on the task at hand and dedicated to the goal of learning. It is built in a conversation based on explicit references to shared experiences, but it can also be supported by indirect, implicit references to shared knowledge that can only be understood by participants. Its existence depends on the contextual efforts of the participants. If the dialogue of participants cannot keep their intelligence, their minds in mutual harmony and focus on the task, then the IDZ bubble bursts, and learning stops [50, p. 38].

The fifth problem – is an understanding of the movement of ZPD in the context of symmetric-asymmetric learning and the quality of communication with peers in the group. The related concepts of scaffolding and ZPD were originally applied to the context of asymmetric teaching and learning, in which a teacher or adult supports a student, usually a child, in achieving tasks beyond their ability to work independently. Western researchers [52] note that these concepts need to be rethought if they are to be applied to a different social context, such as symmetric learning among peer groups. Their analysis, based on data from 2 experimental studies in groups of children from Mexico and the United Kingdom, shows a way to apply the concept of ZPD and scaffolding to understand how different groups of children use language to support collaborative thinking and learning. In both studies, they determined that the ideas of scaffolding and ZPD for symmetric learning required rethinking these concepts as characteristics of dynamic processes in dialogues.

Vygotsky has written extensively about collaborating with peers, but he mostly refers to more capable peers, implying that intellectual asymmetry must exist between participants in any collaborative learning activity. However, as

noted by American researchers [72], learning also takes place in collaboration between students who have a similar level of conceptual understanding. That is, learning and development can also be the result of symmetrical interactions.

The sixth problem – is the problem of moral competence and the contradictory essence of learning as the ability to develop under external guidance, which is analysed in the papers of A.N. Poddyakov [46; 47]. As noted, ZPD is defined by both cognitive abilities to learn and process new information (learning ability in a narrow cognitive sense) and emotional-motivational saturation (which provides a motivational component of learning activities). Paradoxically, according to researchers, ZPD is also determined by the already achieved level of moral competence of a person, and the moral competence that develops in the learning process.

Hence, there is a debatable question about the hidden, negative meaning of the concepts of learning ability and zone of proximal development. According to A.N. Poddyakov [46], it depends on the ability to understand the desires and requirements of the teacher, and the willingness (or unwillingness) to follow these other people's desires and requirements. Too broad ZPD of a child can mean not only their ability to learn new information but also their almost unlimited ability to follow people who are more competent and calculating than themselves, meet any external requirements [73]. This, in turn, means that a person is "more other-shaped than self-created" [74, p. 134]. This is the contradictory essence of learning ability, if understood as the ability to develop under someone else's guidance [73].

Research results indicate, for example, that focusing on the zone of proximal development can lead to negative results. Thus, deviant and delinquent adolescents have a special content of ZPD and, with some external assistance, implement antisocial behaviour and illegal actions [46; 47]. Therefore, the concepts of moral responsibility and moral action are necessary and most important additions to the concepts of pedagogical competence (teacher's side), learning (learning ability), and ZPD (student's side) [75].

Therefore, one of the limitations of many studies of ZPD as scaffolding created by the teacher, which allows the student to master new content, is the lack of connection between the growth of responsibility of the student and the growth of their competence. In particular, the concept of ZPD reflects the growth of the student's competence under the educational guidance of an adult, but not the growth of their responsibility for their increasingly improved actions.

The seventh problem is associated with age-related features of mental development, in particular, with the possible specific features of the ZPD of an adult or an elderly person. Features of ZPD in the process of mastering, for example, new professional knowledge, in particular, its specific features due to age-related features of development in adulthood and old age, is one of the most controversial issues that does not have an exhaustive answer and concerns many researchers and practitioners. Individualisation of mental development in periods of adulthood and old age leads back to the problem of formal and informal (professional and not) adult education as a space for realising their potential. There is reason to believe that adult ZPD is associated on the one hand with a sense of self-efficacy, and on the other – with a willingness to leave the comfort zone.

MODERN EXAMPLES OF USING THE CONCEPT OF ZPD IN LEARNING

The pedagogical potential of the concept of ZPD on the example of teaching students of higher educational institutions is considered below. Researchers list the reasons why it is extremely important to consider the zone of proximal development of students [20; 76; 77]:

1. ZPD guides the process of preparing learning sessions and events.
2. Allows adjusting teaching and learning strategies in accordance with the improvement of students' knowledge and skills.
3. Promotes *experiencing success*, a successful experience that helps to attract and motivate students in the learning process.
4. Allows gradually increasing the requirements for students so that they achieve success at increasingly high levels of learning.
5. Serves as a reference point for measuring the amount of assistance that will be offered to students, so that it can then be gradually reduced.

Further, the most interesting aspect of this approach, in the opinion of the study, is mentioned. Attention is focused on *creating a sense of self-efficacy* in students who, in the process of independent learning with the correct help of a teacher, acquire *confidence* in the possibility of solving the problem (action) [17]. According to research by Canadian researchers, the relationship between ZPD and the emergence of a sense of self-efficacy appears through the phenomenon of experiencing success (Fig. 2).

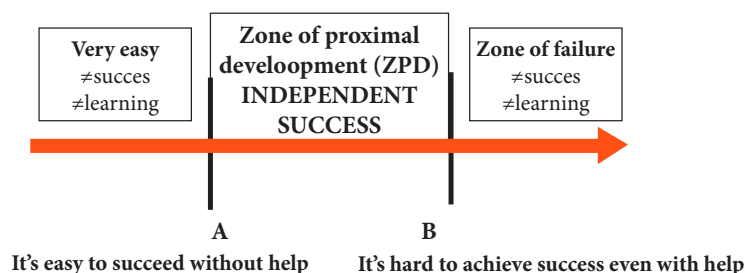


Figure 2. The relationship between ZPD and self-efficacy

Source: according to studies [76; 77]

Bandura once explained this mechanism as follows. When learning takes place at the beginning of the ZPD, students succeed on their own or with a little help. This increases their positive self-perception and experience of their own competence, giving them an advantage in solving more complex problems and problems [78]. Then, when a student, with the help of a teacher, successfully completes a more complex task that is more advanced in their ZPD, and they succeed several times, they can take on more complex tasks that previously were outside of their ZPD. G. Vergnaud believes that this is how the ZPD moves along the line of student personality development and learning progress [76]. A sense of self-efficacy arises from experiencing success in solving relatively accessible and then more complex tasks. According to M. McCaslin Rohrkemper, the emphasis should be placed on the motivational component of initial activity [79]. “The role of a teacher is to allow a young person to manage their autonomy” [80, p. 4], supporting their independent, autonomous learning. It’s about experiencing autonomous success – success realised independently.

In this regard, **the eighth problem** can be considered. How are the concepts of ZPD and getting out of the comfort zone related? According to L.S. Vygotsky, any subject of education and upbringing requires more from the child than they can give at the moment. Thus, learning activities force the child to go beyond their limits, so learning does not exclude discomfort, even if it ultimately brings some pleasure [15].

In the previous example, this can be explained as follows. Symbolically, the ZPD of students is located between two points on the line of gradual development. Point A (on the left) corresponds to the current degree of development, and point B (on the right) corresponds to the most likely development in the near future [76] (Fig. 3). The first part of the ZPD is located in the student’s comfort zone, while the second part is a zone of challenge, discomfort, imbalance, contradiction. Thus, the path of development is the progress from simple and easy tasks (to form a student’s sense of self-efficacy) to a progressive increase in the complexity of tasks, to tasks-challenges that are performed with the support of a teacher.

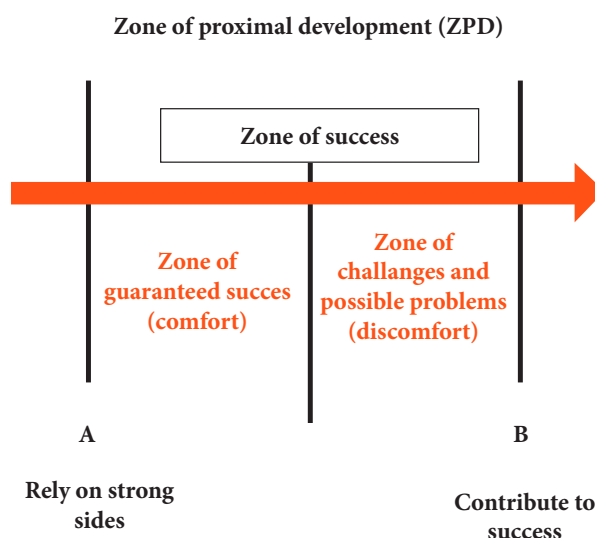


Figure 3. Relationship between ZPD and comfort – discomfort zones

Source: developed according to studies [76; 77]

The paradox of ZPD is that the larger the area of discomfort, the greater the chance of success, but the greater the chance of failure. The general logic of moving along the path of ZPD is that the closer to the area of discomfort, the more help from an adult the child needs. Ideally, the zone of discomfort should become a zone of possible success, and not a zone of failure or defeat. The role of the teacher is to build a balanced movement from point A to point B. One of the methodological techniques for achieving this is, for example, to offer the student several tasks of the same level of difficulty, gradually reducing the help provided.

Thus, although it is often necessary to take small steps [81], it seems that a teacher who wants to promote the cognitive development of their students should offer them

tasks that can create an imbalance of the latter [82]. In other words, they must put them in front of a contradiction. Consequently, the student’s ZPD moves forward to increasingly complex tasks, thereby opening up opportunities for a higher level of development, i.e. challenges that previously would have led to failure will now lead to success [76].

Returning to the problem of ZPD of an adult, an increasing variety of zones of proximal adult development in the conditions of different *types of social interactions* can be assumed (for example, assistance and counteraction, interaction at the level of horizontal and hierarchical interaction, in the context of formal and non-formal learning, etc.) and they have various coping resources. This problem is a promising area of future research in today’s lifelong learning society.

CONCLUSIONS

The problem of the dialectical unity of development and learning and their relationships remains the cornerstone of modern psychology and pedagogy. The quintessence of this problem is the concept of the zone of proximal development, which has become popular in modern Western and Ukrainian psychology and pedagogy in recent years. Disputes and debates about the content of this concept do not subside. They are related to the potential of its application in modern educational practice and simultaneously the impossibility of its unambiguous and consistent operationalisation. Therefore, the concept of ZPD is constantly developing and transforming.

The evolution of the theoretical and methodological status of the concept of ZPD in recent years in modern psychological-pedagogical research is associated with new practices of the pedagogical process as (1) cooperation of a child (group of children) and an adult (teacher) and (2) cooperation of children (group of children) among themselves. This evolution follows the path, on the one hand, of blurring its content, the appearance of simplified, or rather fragmentary interpretations, and on the other – the emergence of its derivatives, that is, similar in content concepts that are derived from the classical concept of ZPD, but have other conceptual accents (for example, the concept of scaffolding, zone of free movement and zone of prompted actions, zone of negative development, zone of variable development, zones of intermental (interpsychic) development in the dialogue between teachers and students, etc.).

On the one hand, the outlined terminological mobility of the content of the concept of ZPD indicates its viability, productivity, and pedagogical potential. On the other hand, (1) the transformation of the content, scope, and essential features of the classical concept of ZPD and (2) the associated inevitable threats of loss of its classical explanatory potential can be considered. This situation gives rise to numerous paradoxes and problematic questions of modern understanding and interpretation of the concept of ZPD, which do not have an exhaustive answer but should be paid attention to by researchers and practitioners in further didactic research. Among them can be noted: the potential of two-plane ZPD (unity of affective and intellectual fields), a pronounced individual character of ZPD, social competence, content and quality of communication between two subjects of interaction that creates ZPD (for example, teachers and students), symmetrical-asymmetric learning and the quality of communication with peers in the group, the essence of ZPD in conditions of different types of social interactions, the contradictory essence of learning as the ability to develop under someone else's guidance, the problem of the specific features of ZPD of an adult or an elderly person, the ratio of ZPD and the zone of psychological comfort and discomfort during learning, its dependence on a sense of their own self-efficacy. Theoretical analysis proves that it is becoming increasingly interdisciplinary, including social, age, cultural, and pedagogical aspects.

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Поняття «зона найближчого розвитку» та його деривати: проблеми та перспективи сучасних інтерпретацій

Анотація. Статтю присвячено теоретико-методологічному аналізу поняття «зона найближчого розвитку», яке має значне практичне значення для освіти, оскільки пояснює механізм впливу навчання на розвиток учня. Тому робота має на меті проаналізувати сучасний зміст та тенденції розвитку цього поняття та його дериватів. У цьому контексті проаналізовано класичні ідеї Л.С. Виготського щодо зони найближчого розвитку та зони актуального розвитку, їхніх показників та сутнісних характеристик, а також еволюція методологічного статусу поняття «зона найближчого розвитку» в психології та педагогіці. Проаналізовано сучасні деривати поняття «зона найближчого розвитку» («scaffolding», «зона вільного руху», «зона заохочуваних дій», «зона негативного розвитку», «зона варіативного розвитку», «зони міжментального розвитку в діалозі викладача і учнів» тощо), його зв'язки та співвідношення із цими спорідненими та взаємопов'язаними поняттями. На основі теоретичного аналізу визначено психолого-дидактичний та евристичний потенціал концепції «зона найближчого розвитку», зокрема щодо використання її як методологічного інструменту для розробки проєктів у різних сферах практики та галузях психології. Останнє продемонстровано на прикладі навчання студентів. Визначено також проблемні моменти та парадокси сучасного розуміння поняття «зона найближчого розвитку». Проблемний аналіз організовано навколо таких тем: потенціал двоплановості зони найближчого розвитку, проблема її індивідуалізації, проблема соціальної компетентності суб'єктів взаємодії, яка створює цю зону, зона найближчого розвитку в контексті симетричного-асиметричного навчання та якості спілкування з однолітками в групі, проблема специфіки зони найближчого розвитку дорослої людини або людини похилого віку, проблема моральної компетентності та суперечливості феномену навченості як потенціалу змінюватися під зовнішнім керівництвом. Отримані наукові результати будуть корисні як для сучасних теоретиків навчання та виховання молоді, так і для педагогів та психологів, які працюють у закладах освіти різного рівня

Ключові слова: психічний розвиток, навчання, Л.С. Виготський, scaffolding, спілкування в навчальному процесі, суб'єкти взаємодії

UDC 159.9.075

DOI: 10.52534/msu-pp.8(3).2022.96-104

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Social and Psychological Rehabilitation of War Veterans

Article's History:

Received: 15.09.2022

Revised: 03.12.2022

Accepted: 28.12.2022

Suggested Citation:

Tsurkan-Saifulina, Yu.V. (2022). Social and psychological rehabilitation of war veterans. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 8(4), 96-104.

Abstract. The subject of the study is determined by the need for effective rehabilitation of war veterans and the presence of many problems of socio-psychological recovery after being in the zone of active combat operations, and the need to develop an effective rehabilitation programme for this category of people. The purpose of the study is to conduct a comprehensive analysis of the features of socio-psychological rehabilitation, identify the relationship of physiological states with individual psychological components of the individual's functioning in specific conditions of life, determine which measures are most effective for the establishment of areas of work in the aspect of socio-psychological rehabilitation of war veterans. The basis of the methodological approach in this study is the analysis and generalisation based on the results of the examination of scientific and theoretical material, which determines the establishment of conclusions and recommendations in the field under study. The following methods of scientific knowledge are used: dialectical, logical-semantic, system-structural, functional, and logical-normative. The study proves the direct connection between the presence of a person in a war zone and their psychoemotional state. It is considered which psychophysiological disorders can be caused by involvement in armed conflicts. The conclusion is formulated that participants in military operations need social and psychological rehabilitation, and problematic issues and prospects for rehabilitation are outlined. Specific medical and socio-psychological aspects are highlighted, the avoidance or generation of which will help in the process of rehabilitation of military personnel and their families. It was identified that although psychological rehabilitation is generally conducted, it requires more government support, popularisation, and wider involvement of both war veterans and experts. Ways to improve approaches to providing psychological assistance to military personnel and their families in Ukraine are proposed. The conclusions of the study are of substantial importance for psychologists and social workers, psychology students and teaching staff of psychology faculties as a doctrinal basis for the educational process

Keywords: psychodiagnostics, psychotherapy, military psychologist, psychological rehabilitation of servicemen, psychocorrection, social and psychological assistance

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INTRODUCTION

Armed conflicts cause a large number of victims and injuries, including psychological ones. Military actions have a huge negative impact on life in general. The war in Ukraine has been going on since 2014. During this time, a lot has been investigated in this area by Ukrainian researchers. In particular, I. Prykhodko, I Lipatov, and L. Shestopalova, considered psychological rehabilitation of military personnel was as such, that should be conducted in two areas: 1) with commanders of all levels to create an atmosphere

of stable neuropsychic reaction in military units; 2) directly with persons who need the help of a psychologist of a military unit [1]. B. Mykhaylov investigated the system of measures for psychiatric and psychotherapeutic care in the case of six groups of disorders among ATO participants: non-pathological reactions, pathological reactions, neurotic disorders, psychotic disorders, PTSD, and chronic personality changes [2]. Also I.I. Prykhodko, S.A. Voloshko, and K.Yu. Gunbin analysed the known methods for assessing the moral and psychological state of military personnel

of the security and defence sector of Ukraine in various conditions of performing service (combat) tasks. It was proved that there are different approaches to determining the categorical apparatus of the moral-psychological state of personnel (MPS) and its assessment [3]. In this aspect, N.M. Mas, who proposed a methodology for evaluating the MPS of personnel of the Armed Forces of Ukraine in a special period on specific scales, both by unit commanders and other specialists who will be involved as a third party, contributed to a more detailed understanding [4]. Today, the security and defence forces of Ukraine operate on an established and scientifically based theoretical and methodological basis, which allows for assessing the psychological state of military personnel to strengthen the combat capability of the army [5]. Moreover, the researchers also investigated the features of the emotional-volitional field, which determine the psychological readiness of military personnel for service-combat activities in active combat zones. A comprehensive empirical study in this area was conducted by S.S. Makarenko, which allowed generalising the algorithm of the psychologist's work on psychological rehabilitation of participants of the Anti-Terrorist Operation (ATO) on the territory of Ukraine who received mental trauma [6]. However, in the space-time aspect, all the above-mentioned studies were conducted even before the start of a large-scale war in Ukraine. The number of comprehensive studies related to the problems of social-psychological rehabilitation of participants in military operations after February 24, 2022, is not yet substantial.

Increasing the number of people injured in connection with military operations requires the development of a rehabilitation system that would be conducted at all levels of medical care, including psychological care [7]. The latter is still insufficiently investigated in the scientific literature, but there are many authoritative findings in this area. A study has been published to identify and outline the causes, interdependence, and treatment of various PTSD symptoms, including anger [8], depression and sleep disorders [9; 10; 11], suicidal moods [12; 13], feeling guilty [14], eating disorders [15] and obesity [16; 17], sexual dysfunction [18], bipolar disorders [19], alcoholism [20; 21], smoking [22], etc. Various types of social and psychological rehabilitation are analysed, in particular, mass cognitive-processual therapy [23], group therapy for military and veteran couples [24], seminars on conflict resolution and prevention of violence in families of military personnel [25], art therapy [26; 27], music therapy [28], theatre therapy [29], inclusive sports training programme [30], etc.

The problem of psychological rehabilitation of war veterans is extremely relevant in connection with the large-scale military invasion of Ukraine. Given the current circumstances, there is an urgent need to investigate the psychological problems of military personnel and persons affected in the zone of active military operations. It is a well-known fact that the stress received due to being in the territory where military operations are taking place, and even in general, in the state in which the war is going on, is

a destabilising factor that limits the functional reserves of the body and increases the risk of disintegration of mental activity and persistent somatovegetative dysfunctions [31]. Only a comprehensive study and practical restoration of the health of participants in armed conflicts and military operations, which, on the one hand, includes medical treatment, and on the other, socio-psychological assistance, will provide an opportunity to actually integrate a war veteran into society as an equal and stable participant in public relations, which will lead to the desired results of rehabilitation in the conditions dictated by the present [32].

Very often, people who have received injuries (both physical and psychological) in connection with military operations cannot find a place in society after they end. A substantial part of the above-mentioned category of people do not find work, lose their families and income. Without psychological help and a rehabilitation programme, for example, a person can become homeless and suffer from a mental illness. In particular, homelessness in some cases can be considered a symptom or manifestation of other psychological difficulties. For these reasons, providing psychological therapy is perhaps the most effective way to solve such problems. Therewith, depression is the most common mental disorder that affects people, including participants in military operations. Ignoring this condition can even lead to suicide.

It is also impossible to dispute the fact that mental health problems, for example, in a partner and a child of a serviceman, are associated with the involvement of a loved one in active military operations. One of the obstacles to further research on the psychological health of war veterans is the lack of a clear exemplary treatment methodology. In this study, it is proposed to consider the examination of injuries resulting from mental and behavioural problems after events in a war zone that cause substantial damage to the psychoemotional state of the individual. According to a study by researchers from the United States of America and Great Britain, there was an additional justification for the position that after the end of hostilities, veterans are prone to suicide (the study referred to tens of thousands of former military personnel). In addition, disorders within one social unit, namely the family, were also further investigated. Researchers note that after experiencing trauma, people and their relatives may develop such different manifestations of addictive behaviour as, for example, alcoholism or drug addiction [33]. Due to the lack of effective measures for psychological recovery and rehabilitation, such conditions tend to worsen [34]. In this regard, veterans of military operations and active military personnel began to develop hidden mental disorders [35]. Therewith, it is impossible to ignore the fact that the initiation and implementation of appropriate psychological rehabilitation programmes in relation to the above-mentioned group of people has had a very positive impact on the overall treatment process. Studies on this subject show that after the practical implementation of such programmes, patients who experienced devastating psychological problems began to feel substantially better, and anxiety, stress, and depression decreased [36].

The purpose of this study is to identify the problematic issues faced by participants of military operations in society and determine which measures and areas of work are most effective for the social and psychological rehabilitation of military personnel and veterans.

Within the framework of this study, the following key issues are considered: 1) socio-psychological rehabilitation of military personnel; 2) socio-psychological rehabilitation of civilians who, by coincidence, became passive participants in military operations; 3) socio-psychological rehabilitation of close relatives of military personnel who are in active combat zones.

MATERIALS AND METHODS

The methodological approach in this research work is based on such methods of scientific knowledge as the terminological, the logical-semantic, the functional, the system-structural, and the logical-normative methods. The theoretical basis of this study consists of the results of findings by a number of researchers from Ukraine, the United States, and Great Britain on problematic issues related to the examination of socio-psychological rehabilitation. The study is based on theoretical analysis and synthesis.

In the first stage of the study, a theoretical basis was prepared, which in the future can be used as a foundation for deeper investigation. In the second stage, the problems of this study are identified, which include questions about the socio-psychological rehabilitation of military personnel, socio-psychological rehabilitation of civilians who, by coincidence, became passive participants in military operations, and socio-psychological rehabilitation of close relatives of military personnel who are in active combat zones, and resocialisation, which is one of the key tasks for normalising relationships and psychological microclimate both in society in general and within one family.

In the last stage, the conclusions are formulated that reflect the results of the study in general and determine the main trends in the development of scientific thought regarding the socio-psychological rehabilitation of war veterans both in Ukraine and abroad. For a comprehensive study of the stated subject of the scientific study, the experience of the existence of an extensive system of state and non-state organisations (support groups, centres, etc.) in the United States was also investigated. Through this, the need to develop a scientifically based programme of psychological rehabilitation of participants in military operations to restore the psychological security of the military's personality is proved.

RESULTS AND DISCUSSION

Today, the number of war veterans with complex physical and psychological injuries is growing. As a result, such subjects are becoming more and more relevant for Ukrainian researchers. Approaches to the rehabilitation of war veterans are now diverse. There is no single methodology that would contribute to a more productive implementation of this process. Effective methods of social and psychological

rehabilitation of war veterans are often implemented without state support, which negatively affects both practical activities and further research. Modern psychology is increasingly raising the issue of techniques and methods of rehabilitation of military personnel. This scientific study is limited to theoretical analysis and focuses on the problematic aspects of the social and psychological rehabilitation of Ukrainian servicemen. In contrast to the papers, in particular, of such Ukrainian researchers as I.I. Prykhodko, S.A. Voloshko, and K.Yu. Hunbin [3], the purpose of this study is to cover the issues of socio-psychological rehabilitation of war veterans in general, without focusing on one specific methodology that allows considering this phenomenon in a comprehensive way. Ultimately, military trauma has created substantial obstacles to the life of military personnel, which hinder recovery and personal growth. Discussing the importance of the study, the importance of the information received for practising psychologists and social workers who help participants in military operations is notable. Of particular relevance is the identification and implementation of effective recommendations that can make the rehabilitation of participants in military operations faster and more effective.

Despite the fact that post-traumatic stress disorder, depression, anxiety, and substance abuse affect a minority of military personnel and veterans, their share still remains substantial. The problems of adaptation of military personnel to everyday life after the war are relevant not only in Ukraine but throughout the world. For example, in the British Armed Forces, a study of mental health was conducted in a comparative aspect with a study of the psychological health of United States military personnel. Similar studies in the UK have shown a link between active service and mental health issues. In numbers, the results are as follows: 22% of the sample of Falklands War veterans had symptoms of post-traumatic stress – a much higher percentage than in the general population. In addition, the troops that were deployed in the first Gulf War in 1991 suffered from higher-than-usual levels of stress and fatigue many years after the conflict. A study of people who were in the Gulf region determined that 50% experienced stress. Psychological difficulties in the sample of British troops increased by 50% after returning from service in Northern Ireland. By June 2006, 1,897 British soldiers had been treated for mental health problems related to their deployment in Iraq [37]. However, such studies were limited to the territorial criterion for conducting the above-mentioned military operations, so they are characterised by certain political features of that time.

If this study were based on survey data, it could provide more specific results as to how vulnerable a former serviceman is and may be prone to social exclusion, which is a substantial risk factor for mental disorders. Working with certain violations of former soldiers, sailors, and pilots is in a sense a return to one of the key points in the retrospective development of therapeutic organisations. Notably, during the Second World War, two military hospitals, namely

Northfield Hospital in Birmingham and Mill Hill Hospital at the beginning of the war, were the first to use therapy group methods. These military hospitals employed four leading psychoanalysts, namely Wilfred Bion, Sigmund Foulkes, Tom Main, and Maxwell Jones, who had a huge impact on this process in general. In particular, during the Second World War, strong ties were formed between medical institutions and the army. This collaboration between psychiatry and the army succeeded in Bion developing a "leaderless group" as a method in the officer selection process, and Foulkes formed the Institute for Group analysis (IGA) [33]. As a result, psychoanalysis was justifiably described as a fundamental area in helping former military personnel. Therewith, family members of servicemen did not receive sufficient psychological assistance.

Various mental disorders that occur after military operations inevitably affect the inner circle of military personnel, including family, partners, brothers, sisters, children, and parents. This leads to the fact that when there is a war in a state, it directly or indirectly affects the psychosocial situation throughout the country. This state of affairs reflects the mood of society within the country in this particular period of time [38]. Today, there is a problem of both theoretical and practical nature in the field of rehabilitation of war veterans. The results of the study show that war veterans, returning to their usual lives, tend to experience problems in their personal life, work, study, and social environment in general. War veterans need effective psychosocial rehabilitation for recovery and reintegration. The most common psychological traumas are adjustment disorder, post-traumatic stress disorder, and depression. A large number of people have experienced the profound effects of military trauma, which has dramatically affected their mental health. People who have experienced war injuries may develop post-traumatic stress syndrome. It is difficult for war veterans to adapt to civilian life after such circumstances. Those who have psychological difficulties may be prone to alcohol and psychotropic substance abuse, so during this period they most need support and help.

It is difficult to understand the real impact of fear, horror, and guilt in the struggle for survival. The main characteristic of the latter is the long-term effect. Such destructive feelings often have a substantial impact on society. In the aspect of such problems, one of the important tasks is to prevent the penetration of violence into the daily life of citizens, since then there will be a threat that the remnants of violence will continue to exist in the social structure of societies even after the end of the war for the following decades [39]. Military trauma can be a prerequisite for the appearance of various psychosocial problems. These psychosocial problems are characterised by the domino effect because they entail many other problems. Another characteristic feature of war veterans is that they blame themselves and feel guilty for certain situations in the zone of active military operations. For example, they may have thoughts of "I didn't do it right", "I didn't do enough", "I didn't save my comrade", "I didn't come back with a victory", etc. Such

self-blame dramatically negatively affects the restoration of psychosocial well-being. The anchor of trauma is, first of all, shame, which leads to isolation from the outside world.

Another and equally important problem is that former military personnel who have received both physical and mental injuries tend to keep everything to themselves, that is, they hide their condition because of the fear of appearing weak. A prerequisite for this behaviour may be stigma. Stigma refers to the negative behaviour (discrimination) of military personnel who have received a combat injury. In turn, the veterans begin to feel ashamed of themselves and become very sensitive [40]. The above is a strong barrier to people seeking help and treatment. In support of this, the results of one study conducted with the military personnel of the United States of America can be recalled. According to its results, 61% of military personnel agree that information about psychological problems in their anamnesis can negatively affect their future career path. In addition, 43% believe that admitting that they have psychological problems will lead to loneliness, detachment, and problems in interpersonal communication [41]. One of the reasons for the occurrence of this situation in society among military personnel can be identified as insufficient social support for military personnel with psychological injuries. Despite the fact that no such study was conducted in Ukraine, the importance and relevance of such results remain.

The results of the theoretical study showed that there is a gap in the legalisation of psychological problems in Ukraine and there is no stable, strong support from the government. Psychological and social work should be integrated primarily at the state level. It is clear that families of military personnel should have unhindered access to social and psychological assistance centres. This problem substantially worsens the effectiveness and completeness of rehabilitation. War-affected individuals are at risk of deterioration in their quality of life during rehabilitation, so the perception of physical health by military personnel with combat injuries may improve after psychotherapy. Further in-depth research is needed to confirm this scientific opinion. In general, the result of this research work and the conclusions formulated on their basis, are important both theoretical and practical to improve scientific approaches to understanding the content of socio-psychological rehabilitation of war veterans. Such results can be used in the future as an established scientific base for investigating the prospects of research.

According to the author, further research should not be limited to the range of injuries received by military personnel in the combat zone, but firstly, be aimed at improving the mechanism of training military personnel, which will subsequently affect the process of rehabilitation after the war, and the study of such an impact on their family members. For example, the combat experience after the military events in Bosnia contributed to the development of new military training programmes. The latter has led to a revision of established approaches, in particular, to minimise the resulting traumas. The study, which

involved veterans of Operation Desert Storm, also added a lot of new knowledge in this regard. However, military operations continued, combat missions increased, and military units expanded. All of this has raised a number of new questions for US military personnel and new challenges for their families. To date, there are no studies and results on how psychoemotional experiences affected the children of participants of Operation Desert Storm. However, the US government understood how important it was to preserve the well-being of the families of war veterans. This is primarily due to the fact that the state should be interested both in preserving the mental health of experienced military professionals and in developing a healthy future for the army. Notably, it is advisable to introduce, for example, group support clubs for war veterans to strengthen the success of individual therapy. Everything combined can give a long-term and stable effect.

In general, the concept of mental health according to the World Health Organisation is considered as a certain state of well-being of the individual, in which they have the opportunity to realise their abilities and talents. This state also means that it is mostly easier for a person who is in it to cope with life's stresses, they have the strength and inspiration to live on, allow themselves to enjoy the usual things. It is worth noting that, undoubtedly, military personnel with amputated body parts due to military operations are at risk of deterioration of the quality of life after amputation. Helping people who have returned from the war with amputated limbs is another key task. This study focuses on changes in the quality of life that are associated with the physical and mental health of military personnel after such injuries. The latter affects the way of life in a certain way, and there is a need to get used to the new reality. During rehabilitation, physical recovery, psychological adjustment, and adaptation to a new lifestyle should simultaneously occur. Therefore, during rehabilitation, it is necessary to pay sufficient attention to mental health in particular [42].

According to the author, the use of psychotherapy is effective in providing assistance to participants in military operations. During systematic individual psychotherapy sessions, clients' mental disorders are corrected using psychological techniques. Communication about conflicts is encouraged to relieve symptoms, correct behaviour, and improve social and professional functioning. This helps the patient understand the suppressed conflicts that are the source of difficulties. Due to the use of psychotherapy, the patient's behaviour changes, positive reinforcement is used, increased self-efficacy and more positive attitudes develop. Interaction between clients is an integral part of the therapeutic process [43]. Group therapy focuses on interpersonal interactions, so it can solve relationship problems. The purpose of group psychotherapy is to help overcome emotional difficulties and stimulate the personal development of group members. Group members share the personal challenges they face when adapting to civilian life with others. Participants can talk about events in which they were involved during their stay in the armed forces, during their stay without housing,

or even during the last week. By talking about their feelings, thoughts, and experiences, participants can give each other feedback, encouragement, support, or criticism. Group members feel less alone despite their problems, and the group can become a source of support and strength during times of stress for the participant and a territory for new behaviours [44]. Later, employees can use their contacts with clients in this social environment to help the client reflect on their experiences of family life, in particular, caring for others and how they were cared for as children. The goals of such social activities vary from building a specific community to encouraging reflection on relationships and parenting strategies.

Family members should also understand that they have an important influence on their relatives fighting in the war zone. This directly affects the effectiveness of post-war rehabilitation. However, questions about past traumatic events, frivolous everyday advice on how to deal with certain experiences, and obtrusive caring will not lead to the desired result. Under such conditions, participants in military operations will begin to distance themselves from their relatives, and they may have the desire to return to the war, where their fellow soldiers, who have experienced similar situations, serve. Therefore, support is a key aspect in such circumstances. Today, psychological assistance to participants in military operations can be divided into several levels. The first is the individual level, when psychological assistance is provided directly to the participant of military operations. The second is manifested, for example, in the form of psychological support [45]. Given the above, the fighting in the East of Ukraine, which today substantially affects the psyche of citizens, causes irrevocable changes in the life and behaviour of the entire nation. The need to improve rehabilitation measures, including the involvement of researchers, doctors, and social workers, is extremely urgent. The system of comprehensive rehabilitation measures should not be limited only to the participants of military operations themselves, but also include their family members.

Monitoring the methods and means of psychological assistance to participants of military operations in developed countries of the world helps to understand in which direction to move to improve this process and get the best possible results. Notably, in Ukraine, psychological assistance to families of military personnel is not fully integrated into social and psychological work. The gap in unity between these areas substantially worsens the effectiveness and completeness of the rehabilitation of military personnel, and violates the integrity and phased provision of comprehensive assistance to families of Ukrainian military personnel, which negatively affects social and psychological rehabilitation. Each psychological technology unfolds simultaneously in several aspects (personal, instrumental, space and time). Psychologists should devote enough time to the personal vector, which aims to restore the integrity and balance of the individual. Therewith, it is necessary not to disregard the instrumental vector, the purpose of which is to restore an understanding of self-efficacy and opportunities for

self-realisation. In the integrated approach, the spatial vector is focused on improving communicative competence, namely overcoming alienation from the surrounding world and constructively resolving social conflicts. In addition, it is important to consider the time vector, which is aimed at finding values, new life guidelines and building their new structure [46]. The main areas of improving the process of social and psychological assistance to military personnel in the active combat zone should be based on the international experience of the functioning of an extensive system of state and non-state organisations and institutions, volunteer centres, and support groups.

CONCLUSIONS

Ukraine faced the negative consequences of the war. The main one is the trauma (both physical and psychological) of participants in military operations. Depression and stress have become static characteristics for all those who have been and/or are in an active combat zone. In this context, a big gap that needs to be filled immediately is that there are a large number of war victims who keep silent about their problems, and therefore do not receive any treatment. The war affects the entire nation in general, causing irreparable losses and substantial damage. Effective psychosocial rehabilitation measures should be detailed, structured, and put into practice as soon as possible. This study mentioned such forms of rehabilitation as individual and group therapy. In addition, it is necessary to introduce more social programmes to support families of military personnel (employment, housing, etc.). Psychosocial rehabilitation is designed to achieve balance and make the patient want

to live a full and meaningful life. All of the above should give more meaning to the current life. Psychological rehabilitation is necessary to achieve a level of psychological health for the individual in which the war veteran will understand the importance and feel satisfied in a given time and place and now.

The process of socio-psychological recovery for participants in military operations can be divided into the following stages, in each of which it is advisable to use appropriate rehabilitation techniques consisting of specific techniques. The study covered the preparatory, basic, and auxiliary stages. One of the main tasks at the first of them can be defined as the search for motivational elements for restoring one's psychological health, identifying and activating the blind spots of existing opportunities, and outlining the path to psychological well-being. At the next basic stage, it is better to devote attention to the creative design of the future of the person, which should include a balance of interests and responsibility for their own life. At the auxiliary stage, traumatic memories are transformed into a new attitude to the experience as a resource.

The results of investigating this problem may be useful for future research and improving assistance in the provision of psychological services in Ukraine. Further research should scrupulously look for answers to the question of how to provide high-quality and simultaneously accessible psychological rehabilitation services for victims of military operations, considering such criteria as the place of residence of participants in military operations, ensuring the involvement of specialists in social and psychological rehabilitation in various fields, such as social workers, psychologists, doctors, volunteers, etc.

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Соціально-психологічна реабілітація учасників бойових дій

Анотація. Тематика наукового дослідження зумовлена потребою в ефективній реабілітації учасників бойових дій та наявністю безлічі проблем соціально-психологічного відновлення після перебування в зоні активних бойових дій, а також необхідності розробки ефективної програми реабілітації такої категорії людей. Мета науково-дослідної роботи – здійснити комплексний аналіз особливостей соціально-психологічної реабілітації, виявити взаємозв'язок фізіологічних станів з окремими психологічними компонентами функціонування індивіда в конкретних умовах життєдіяльності, з'ясувати, які заходи найбільш ефективні для формування напрямів роботи в аспекті соціально-психологічної реабілітації учасників війни. Основа методологічного підходу в цій науково-дослідній статті – взаємозв'язок аналізу та узагальнення за результатами дослідження науково-теоретичного матеріалу, що зумовлює формування висновків та рекомендацій у досліджуваній сфері. У науковому дослідженні використано такі методи наукового пізнання: діалектичний, логіко-семантичний, системно-структурний, функціональний та логіко-нормативний. У статті доведено безпосередній зв'язок присутності особи в зоні бойових дій та її психоемоційного стану. Розглянуто, які психофізіологічні розлади може спричинити участь у збройних конфліктах. Сформульовано висновок про те, що учасники бойових дій потребують соціально-психологічної реабілітації, окреслено проблемні питання та перспективи здійснення реабілітації. Виокремлено конкретні медичні та соціально-психологічних аспекти, уникнення або генерування яких допоможе в процесі реабілітації військовослужбовців та їхніх сімей. Виявлено, що хоча психологічна реабілітація в цілому проводиться, вона потребує більше урядової підтримки, популяризації та ширшого залучення як учасників бойових дій, так і експертних спеціалістів. Запропоновано шляхи вдосконалення підходів до надання психологічної допомоги військовослужбовцям та їхнім сім'ям в Україні. Висновки роботи мають суттєву значимість для психологів та соціальних працівників, а також для студентів-психологів та викладацького складу факультетів психології як доктринальна база навчального процесу

Ключові слова: психодіагностика, психотерапія, військовий психолог, психологічна реабілітація військовослужбовця, психокорекція, соціально-психологічна допомога

**НАУКОВИЙ ВІСНИК
МУКАЧІВСЬКОГО ДЕРЖАВНОГО УНІВЕРСИТЕТУ
СЕРІЯ «ПЕДАГОГІКА ТА ПСИХОЛОГІЯ»**

Науковий журнал

Том 8, № 4. 2022

Заснований у 2015 р. Виходить чотири рази на рік

Оригінал-макет видання виготовлено
у редакційно-видавничому відділі Мукачівського державного університету

Відповідальний редактор:

М. Ковінько

Редагування англomовних текстів:

А. Кравченко

Комп'ютерна верстка:

К. Соседко

Підписано до друку 28.12.2022 р. Формат 60*84/8

Умовн. друк. арк. 12,3

Тираж: 300 прим.

Адреса видавництва:

Мукачівський державний університет
89600, вул. Ужгородська, 26, м. Мукачево

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**SCIENTIFIC BULLETIN
OF MUKACHEVO STATE UNIVERSITY
SERIES “PEDAGOGY AND PSYCHOLOGY”**

Scientific Journal

Vol. 8, No. 4. 2022

Founded in 2015. Published four times a year

The original layout of the publication is made
in the publishing department of Mukachevo State University

Managing Editor:

M. Kovinko

Editing English-Language Texts:

A. Kravchenko

Desktop Publishing:

K. Sosiedko

Signed for print 12/28/2022. Format 60*84/8

Conventional printed pages 12.3

Circulation 300 copies

Publishing Address:

Mukachevo State University
89600, 26 Uzhhorodska Str., Mukachevo
Transcarpathian region, Ukraine
E-mail: info@pp-msu.com.ua
<https://pp-msu.com.ua/en>