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**PSYCHOLOGICAL READINESS OF STUDENT YOUTH FOR ECOLOGICAL AND
CONSUMER BEHAVIOR**

Abstract. The article analyzes the peculiarities of the formation and development of psychological readiness of student youth for environmental and consumer behavior. The psychological analysis of the content and essence of the phenomenon of "psychological readiness" is carried out. It is stated that the level of development of psychological readiness of student youth for ecological and consumer behavior will largely depend on the ecological future of mankind and their own ecologically appropriate behavior in response to current or future environmental threats. It is proved that shortcomings and mistakes in the attitude to the natural environment, misconceptions about the inexhaustibility of natural resources, shifting responsibility for the consequences of environmentally inappropriate behavior to others, usually related to personal qualities and psychological unpreparedness of students for environmental and consumer behavior. It is established that the formation of psychological readiness of student youth for ecological and consumer behavior involves the formation of such necessary ecological attitudes, personality traits that provide the individual with the opportunity to prefer eco-friendly behavior and consciously manifest it. At the same time, it is not necessary to reduce the formation of readiness for the development of certain personal qualities in student youth, to their simple sum. Readiness is expressed in a high level of development of independence in the process of choosing and demonstrating environmental coping strategies as ways to overcome environmental threats. It is determined that the psychological readiness of student youth for environmental and consumer behavior is manifested in the presence of: the necessary environmental knowledge, skills and abilities, environmental intelligence and thinking; environmentally sound qualities (environmental discipline, organization and responsibility) that help to activate pro-environmental behavior; sustainable positive attitude to the necessity and importance of the manifestation of eco-appropriate behavior and the desire to constantly develop their environmental knowledge and skills; internal need to demonstrate pro-environmental behavior. It is stated that the ecological position of student youth influences ecological and consumer behavior through ecological control, which is expressed in ecological self-efficacy and ecological internality. The ecological position, given the dominance of the well-being of other individuals, influences the ecological and consumer behavior of student youth by increasing self-efficacy in the environmental sphere. The position of dominating the well-being of others activates pro-environmental norms, which encourages the assessment of eco-destructive actions as unacceptable. Ecological position influences ecological and consumer behavior indirectly through subjective connection with nature.

Key words: eco-destructive actions, eco-conservation actions, ecological-consumer behavior, psychological readiness, student youth.

Formulation of the problem. In the light of current trends in environmental challenges, there is an urgent need for scientific knowledge of the psychological readiness of student youth for environmental and consumer behavior.

In the conditions of neglect of the state of ecological environment in student youth it is necessary not only to form necessary knowledge on features of preservation of environment and maintenance of proper conditions of existence and development of mankind, but also to develop psychological readiness to own ecological and consumer behavior. The level of development of psychological readiness of student youth for ecological and consumer behavior will largely depend on the ecological future of mankind and their own ecologically appropriate behavior in response to current or future environmental threats. Ecological and consumer behavior makes new demands on the life of modern young people. This is, above all, a high level of

awareness that the main source of human resources are ecological systems and the manifestation of effective strategies to overcome environmental threats today. Students need to understand that people cannot and do not have the right to manage nature, ecosystems are limited, natural resources are depleted, and technologies aimed solely at adapting nature to meet needs are detrimental. It is quite difficult to find harmony between social and environmental realities in the life of a modern young person. Because of this, the high level of development of students' readiness for ecological and consumer behavior involves the development of a conscious approach to the assessment of actions that cause disturbances in the natural balance; understanding that any environmentally significant behavior will lead to positive change; taking into account that while maintaining eco-destructive behaviors, the number and level of existing environmental problems may increase.

Analysis of recent research and publications. The problem of ecological and consumer behavior of the individual was considered in one way or another by both Ukrainian and foreign scientists (K. Abulkhanova-Slavskaya, K. Baeva, A. Brushlynsky, O. Vernik, I. Kryazh, G. Kostyuk, T. Tytarenko, O. Leontiev, M. Savchin, V. Romenets, J. Rotter, K. Rogers, A. Maslow, E. Fromm, F. Perls, K. Jung, etc.) [1]. J. Schumpeter made an important contribution to the development of general conceptual approaches to the psychology of consumption. The formation of the motivational sphere of consumer behavior was studied by J. Atkinson and J. McClelland. The psychological structure of consumer behavior was studied by O. Zavyalova. However, the psychological readiness of student youth for environmental and consumer behavior in theoretical and methodological terms requires more research.

The concept of "psychological readiness" is interpreted differently by scientists. Thus, B. Ananiev, N. Levitov, S. Rubinstein explain this statement by the presence of abilities to a certain type of activity. K. Platonov argues that psychological readiness is a stable quality of personality. I. Blazhava and D. Uznadze consider readiness in the context of psychotechnics. They consider it a psychological state and an essential feature of the installation. Another interpretation is given by I. Ladanov, who explains readiness as a psychological condition due to which the vital activity of a particular individual is successful. V. Serikov and R. Romanenko consider this phenomenon more broadly. In their understanding, psychological readiness is a set of practical skills, moral and volitional qualities and different behaviors.

A. Derkach and I. Yaroshchuk [6, p. 66-73] consider readiness as a manifestation of all aspects of personality in unity. A. Galyan researching the category of readiness emphasizes the personal approach to the study of readiness, studies it through a complex psychological formation [2, p. 23]. The author attaches great importance to cognitive mental processes that reflect the most important aspects of human life, emotional components, which, in turn, can increase or decrease activity and volitional qualities that help to effectively perform actions in the process of achieving the goal.

The psychological readiness of student youth for ecological and consumer behavior should be understood as the ability of the individual to identify and formulate tasks for environmentally sound behavior, assess their own capabilities for their own environmentally friendly behavior, choose effective ways to solve environmental problems [3, p. 96-100]. It should be emphasized that the psychological readiness of student youth for environmental and consumer behavior is a special mental state that activates personal factors in the regulation of environmentally significant behavior. Also, considering the content and essence of the phenomenon of readiness, it is necessary to pay attention to the fact that psychological readiness is an expression of the orientation of the individual to a certain activity [5, p. 51-62]. It is one of the most important and essential prerequisites for purposeful environmentally sound behavior.

In general, the issue of psychological readiness of student youth for environmental and consumer behavior should be considered from the standpoint of personal-activity approach (L. Bozhovich, M. Dyachenko, L. Kandybovich); personal (P. Gornostay, E. Klimov); functional (R. Ovcharova, D. Uznadze); transformational-practical (K. Abulkhanova-Slavskaya). However, there is no approach that would be fully recognized.

It should be noted that in the analysis of scientific approaches to the study of psychological readiness of student youth for environmental and consumer behavior, it was found that the views of domestic and foreign scientists differ significantly. Thus, domestic scientists are based on the activity approach, according to which readiness should be considered as an integrative characteristic of the individual, which includes actively significant environmental qualities, skills, motives, goals and values. Representatives of this approach are I. Zyazyun, Y. Pelekh, L. Serdyuk. A distinctive feature of their views is that they did not equate readiness with competence.

According to the views of foreign scientists (T. Bourdon, P. Meadows, D. Houston, T. Bixon, S. Lowe, M. Schaefer), readiness should be considered through competence as a necessary and basic component of

environmentally sound activity. Also important components, according to this approach, are environmental activities that are manifested in interaction with the natural environment and solving environmental problems. For them, both competency and personality components are equivalent [7, p. 754-778].

When describing the psychological readiness of student youth for environmental and consumer behavior should refer to two main approaches: personal and functional. Within the framework of these approaches, the content and structure of psychological readiness were determined. Consider in more detail the psychological readiness of student youth for environmental and consumer behavior at the personal and functional levels.

Representatives of the personal approach (M. Dyachenko, L. Kandybovich, A. Puni, D. Uznadze, etc.) consider psychological readiness as the ability to a certain activity. They define readiness as a mental state and personality characteristics, integrative quality; disclosure of potential opportunities, complex personal education; combination of all structural components of the psyche.

The personal approach divides psychological readiness into long-term and situational. The difference is in the sustainability of the qualities that a young person needs for the effective manifestation of environmentally sound behavior. Yes, long-term readiness implies the presence of sustainable, environmentally important qualities. The essence of situational readiness is that the individual activates certain environmentally sound qualities under the influence of a particular situation and those current environmental tasks that need to be performed.

In general, despite different approaches in research, most authors consider psychological readiness as a specific phenomenon - an integrative formation that has a complex, dynamic, multicomponent structure.

Unresolved aspects of the problem. Theoretical and methodological analysis of the works showed that the problem of development of psychological readiness of student youth for ecological and consumer behavior remains out of the attention of scientists. Deficiencies and mistakes in the attitude to the natural environment, misconceptions about the inexhaustibility of natural resources, shifting responsibility for the consequences of environmentally inappropriate behavior to others, usually related to personal qualities and psychological unpreparedness of students for environmental and consumer behavior.

The question of psychological readiness of student youth for ecological and consumer behavior, which is a complex structural-level formation that goes through a long period of its formation, improvement and development, is characterized by long-term formation, arises as a result of specially organized external influences and is insufficiently studied. The analysis of the peculiarities of the development of the psychological readiness of student youth for the manifestation of ecological and consumer behavior becomes especially relevant. Fundamental and applied research of the development of psychological readiness of student youth for the manifestation of ecological and consumer behavior is aimed at developing the principles of formation of ecologically important personality characteristics. It is the study of the dynamics of the relationship between environmentally constructive and environmentally destructive behavior and the personality of young people will determine the algorithm for the effective development of the readiness of student youth for environmental and consumer behavior.

Taking into account the results of research of a large number of domestic and foreign scientists involves finding answers to the question of what is the fundamental, fundamental goal of eco-destructive and eco-constructive interaction of young people with the environment. In the conceptual and theoretical aspect of considering such interaction, two polar points of view can be distinguished: one is based on the recognition of environmentally friendly behavior, the other - on the adoption of eco-destructive behavior.

Special emphasis in the process of forming and developing the readiness of student youth for ecological and consumer behavior should be made on the formation of an ecologically developed, harmonious personality, which combines a set of ecological-pragmatic and ecological-spiritual qualities. That is, the psychological readiness of student youth for ecological and consumer behavior will contribute not only to achieving positive results in the process of human interaction with the natural environment, but also personal satisfaction from such activity.

In the process of developing the psychological readiness of student youth for environmental and consumer behavior should adhere to the principle of combining activity and personal characteristics of the subject of activity, as well as orderliness of internal structures, consistency of the main components of the young person's personality in stability, stability and continuity. The development of psychological readiness of student youth for environmental and consumer behavior involves the formation of a holistic understanding that eco-conservation actions are constructive and destructive actions are destructive.

The purpose of the article is to theoretically analyze and empirically diagnose the peculiarities of the formation and development of ecological and consumer behavior of student youth.

We consider the psychological readiness of student youth for ecological and consumer behavior as a complex integrative formation, which simultaneously reflects the level of development of eco-conservation actions and abilities of the individual and the peculiarities of his attitude to the natural environment. The dynamic structure of the psychological readiness of student youth for environmental and consumer behavior is a holistic education, which includes personal characteristics, the main of which are motivational (the need to make a positive impact on the environment, interest in understanding the causes of global imbalance, desire and the desire to increase the level of subjective connection with nature); cognitive (understanding of environmental responsibilities, environmental objectives, assessment of their significance for humanity in general and for oneself in particular; emotional (sense of environmental responsibility, emotional uplift in case of eco-constructive behavior); volitional (self-management, mobilization of environmental efforts, focus on manifestation of ecologically appropriate behavior, overcoming environmental doubts, environmental sustainability, the ability to ecological self-regulation in their own lives) (see Fig. 1).

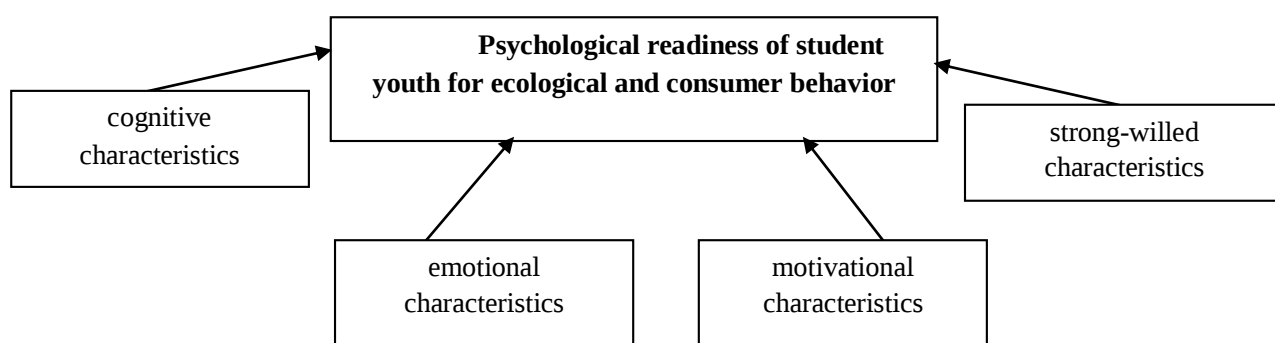


Fig.1. Dynamic structure of psychological readiness of student youth for ecological and consumer behavior

The formation of psychological readiness of student youth for environmental and consumer behavior involves the formation of such necessary environmental attitudes, personality traits that provide the individual with the opportunity to prefer eco-friendly behavior and consciously manifest it. At the same time, it is not necessary to reduce the formation of readiness for the development of certain personal qualities in student youth, to their simple sum. Readiness is expressed in a high level of development of independence in the process of choosing and demonstrating environmental coping strategies as ways to overcome environmental threats.

Thus, the psychological readiness of student youth for environmental and consumer behavior is manifested in the presence of:

- necessary ecological knowledge, skills and abilities, ecological intelligence and thinking;
- environmentally sound qualities (environmental discipline, organization and responsibility) that help to activate pro-environmental behavior;
- a stable positive attitude to the necessity and importance of the manifestation of eco-appropriate behavior and the desire to constantly develop their environmental knowledge and skills;
- internal need to demonstrate pro-environmental behavior.

To understand the ecological and consumer behavior of student youth, it is necessary to pay attention to its main types. There are two types of environmental and consumer behavior:

- student youth, for whom the consumption of tangible and intangible benefits brings satisfaction and joy. Such young people usually do not care about the consequences of their own consumption. In the process of consumption, fashion trends and prone to status consumption are taken into account. Sometimes, such consumers have an excessive tendency to purchase goods and services, to accumulate material goods. The determining factor in the life of the subjects is often the benefit of their own benefit;
- young people who demonstrate balanced and thoughtful consumption. Such individuals are frugal; rarely make impulsive purchases; make every effort to limit their consumption, because for them it is valuable to benefit other living individuals. Such consumers are often guided by ethical principles.

A special place in the way of life of student youth in general, and ecological and consumer behavior in particular is occupied by motives of greening, namely: the purchase of environmentally certified products; taking into account penalties; effectiveness of environmental certification and labeling, etc. One of the profound factors influencing the degree of ecological and consumer behavior of modern youth is their needs. Conscious environmental needs form the basis of motivations for the purchase of environmental goods. The interest of student youth in environmental products can be transformed into environmental priorities in relation to their own consumer demand. An important condition for the formation of demand for environmental goods and services is the presence of young people with information about the existence of goods and their quality. That is why the reorganization of the existing way of life of student youth and the transition to an ecological-consumer way becomes especially important. Improving the environmental efficiency of modern youth is possible if the environmental direction and strengthening of consumer and environmental positions.

In addition, the development of ecological and consumer behavior of student youth should include the creation of a new ecological environment; changing existing stereotypes about the environmental socio-economic life of modern man; identifying ways to form the attractiveness of environmentally friendly consumption. In the ecological and consumer behavior of student youth, the core of the structural organization of psychological readiness for ecologically oriented life is the ecological position, which is manifested in the free ecologically oriented expression of will.

To achieve this goal at the empirical level, the following psychodiagnostic methods were used: questionnaire of ecological installations "Eco 30" I. Kryazh, scale "New ecological paradigm" ("NEP") R. Dunlop, K. Van Lear; J. Rotter's locus of control scale, ecological internality scale (Eco-30), ecological internality screening scale, M. Ojala environmental self-efficacy questionnaire; scale of general self-efficacy R. Schwartz, M. Jerusalem.

An empirical study of the peculiarities of ecological and consumer behavior of student youth confirmed the connection of indicators of ecological position of the studied with ecological norms and ecologically significant behavior manifested in ecological and consumer behavior (Table 1).

Table 1.
Correlations of connection of indicators of ecological position with ecological norms and ecologically significant behavior

<i>Variables</i>	The benefit of other individuals	The benefit of their own benefit	"Environmental behavior in everyday life"
Ecological internality	0,22 $p < 0,01$	-0,12 $p < 0,01$	0,38 $p < 0,01$
General internality	0,13 $p = 0,059$	-	-
Environmental self-efficacy	0,39 $p < 0,01$	-0,59 $p < 0,01$	0,33 $p < 0,01$
Overall self-efficacy	-	-	0,18 $p < 0,01$
"Environmental behavior in everyday life"	0,28 $p < 0,0001$	-0,35 $p < 0,0001$	
Individual ecological internality	0,41 $p < 0,01$	-0,44 $p < 0,01$	0,44 $p < 0,01$
"Correct" in normal situations	0,11 $p < 0,1$	-	-

* Note: Spearman's rank correlation coefficient

It should be noted that the benefit of other individuals ($r = 0.28$; $p < 0.01$) and the benefit of personal gain ($r = -0.35$; $p < 0.01$) are associated with personal pro-ecological behavior in everyday life. Ecological internality promotes pro ecological behavior in everyday life ($r = 0.38$; $p < 0.01$). The links between the indicators of the ecological position and the individual ecological internality (the correlations for the scales of "Other individuals" and "Benefits of personal gain" are 0.41 and -0.41, respectively) were quite strong, which encourages pro-ecological behavior. Thus, the ecological position is able to influence ecologically significant

behavior through the strengthening of individual ecological internality, i.e. the consideration of oneself as an entity responsible for environmental threats. In student youth with a dominant environmental position for the benefit of others, high self-efficacy in solving environmental problems can enhance overall self-efficacy. Researchers who believe that their own actions significantly affect the state of the environment tend to believe that they are able to respond effectively to environmental challenges and environmental challenges. The ecological position and the general self-efficacy of student youth affect the readiness to demonstrate pro-environmental actions in everyday life. Environmental self-efficacy affects environmentally responsible behavior in everyday life (0.11, $p < 0.055$). Focusing on the well-being of other individuals affects the development of the ability to improve the environment. Focusing on other individuals, ie biosphere activates environmental self-efficacy. Student youth with a focus on other individuals recognizes the anthropogenic nature of environmental problems; equality between man and nature; himself part of nature, so evaluates actions and situations that harm all living things as an abnormal phenomenon.

Thus, the ecological position of student youth influences ecological and consumer behavior through ecological control, which is expressed in ecological self-efficacy and ecological internality. The ecological position, given the dominance of the well-being of other individuals, influences the ecological and consumer behavior of student youth by increasing self-efficacy in the environmental sphere. The position of dominating the well-being of others activates pro-environmental norms, which encourages the assessment of eco-destructive actions as unacceptable. Ecological position influences ecological and consumer behavior indirectly through subjective connection with nature. Subjective connection with nature, strengthened by the ecological position, influences ecological and consumer behavior in everyday life, strengthens control in the ecological sphere.

The results of the study of ecological and consumer behavior of student youth showed that the general trend of modern society is to recognize the environmental factor as a leader in the structure of the consumer market. The topic of ecological quality of goods and services ceases to be the subject of discussion of marginals and supporters of a certain way of life, and increasingly forms the basis of market capitalism.

By making an environmental decision to do one way or another, student youth thus demonstrate the level of their own psychological readiness for eco-appropriate behavior. Psychological readiness for ecological and consumer behavior is related to the motivational sphere of student youth, its intellectual potential and moral and ethical worldview. The essence of the psychological readiness of student youth for environmental and consumer behavior depends not only on external situational factors, but also on the internal mechanisms of development of this psychological phenomenon. Psychological readiness of student youth for ecological and consumer behavior is one of the most important indicators of modern human life. The future of mankind and the quality of solving existing environmental problems largely depend on the level of psychological readiness.

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STRATEGIES OF EMOTIONAL REGULATION IN SUPPORT OF ECOLOGICALLY ORIENTED HUMAN ACTIVITY

Abstract. *The article presents the results of an experimental study of the strategies of adolescents' emotional regulation, analysis of the impact of ways of overcoming, coping with stressful situations on the constructiveness (environmental friendliness) of emotional personality regulation in environmentally oriented life. The study used theoretical, empirical and data processing methods (Pearson's correlation coefficient). Based on the analysis of the psychological literature of native and foreign researchers, the essence of the concept of "emotional regulation", "environmental strategies for managing emotions" within environmental psychology is clarified. The study of strategies for regulating students' emotions, in order to determine the frequency of use of constructive (environmental) strategies for emotional regulation to maintain environmentally oriented life. Features of strategies of students' emotional regulation through the level of formation of cognitive components of emotional regulation, features of control over emotions, intensity and frequency of use of certain styles of protection against affective situations are revealed. The psychological features of constructive and destructive strategies of emotion regulation are described, the peculiarities of their connection with behavioral strategies and personal styles of the subject's reaction to an emotional situation are determined. The results of the experimental study allowed us to conclude that young men and women in stressful situations prefer constructive strategies to regulate emotions, which help to find solutions, manage a difficult situation and cope with its consequences. The use of destructive strategies in coping with stressful situations leads to negative experiences, the strength and duration of which depend on the context of the situation. However, destructive experiences prevent young people from maintaining an environmentally oriented life.*

Key words: *destructive strategies of emotion regulation, ecological strategies of emotion regulation, emotional regulation, constructive strategies of emotion regulation, strategies of emotional regulation, adolescence.*

Introduction: In recent years, there has been a growing interest in the study of psychological aspects of personality interaction with the environment (natural, anthropogenic, spatial, social, educational, informational, etc.) and this is no accident, as many researchers conclude the need to analyze the relationship of its parameters, development and behavior of the subject. Mental states of the individual in special, affective situations are of great interest, because throughout life everyone is faced with situations that are perceived as complex, difficult, extreme. Significant daily psychological burdens, experiences of stressors are accompanied not only by different intensity and duration of negative emotional experiences of the individual, but also the accumulation of psycho-emotional stress, mental maladaptation and disorganization of its behavior. Thus, there is a need not only to regulate their own emotional state in order to eliminate the imbalance between the requirements of the environment and the inner ability to overcome affective situations, but also to find effective strategies for emotional self-regulation in various life situations.

The aim of the article is to present the results of experimental research on the features of strategies of emotional regulation of adolescents, analysis of the impact of overcoming the constructive (environmental) emotional personality regulation in environmentally oriented life.

The experimental work was attended by 92 students. During the study methods were used: theoretical (analysis of scientific sources, generalizations); empirical (testing); data processing (percentage and comparative analysis); statistical generalizations were performed using the Pearson correlation coefficient.

Theoretical foundations of the study: According to V. Panov's concept, the field of research of ecological psychology is the problems of consciousness and personal identity, his mental development and learning, experiences and behavior, psychological and physical health, which are considered in the context of relations "man – environment" (natural, social). These relationships are concretized in many ways in research [11, p. 14]. Socialization and individualization of man at different age stages of his psychological development is a process and result of the totality of his interaction with the environment, which is described as ecopsychological interaction. Under ecopsychological interaction V. Panov understands the interaction of the subject (group, organization) with different types and components of the environment.

The ecological approach is not limited to the study of ecopsychological interaction. L. Chuiko points out the importance of greening the consciousness of the individual. The greening of the consciousness of the individual can be carried out in two directions: through the formation of ecological thinking and the formation of ecological culture. According to L. Chuyko, ecological thinking is the adoption of a specific, characteristic of the subject, and way of thinking. The formation of ecological thinking means to teach the subject a specific intellectual activity, which will determine the choice of actions based on the ecological imperative. Ecological imperative is a certain moral prescription to act in accordance with ecological expediency, based on the system of ecological values [3, p. 70]. L. Chuyko states that in the developed form of the ecological imperative becomes an unconditional principle of behavior for the individual in any situation, and to achieve the highest degree of its development serves as a moral criterion of any activity.

O. Vovchyk-Blakytina points to the role of personal characteristics in the greening of human life, which belong to a certain level of the holistic structure of personality organization: emotional, cognitive, and value-semantic. At the level of analysis of emotional factors, the author believes that it is significant to consider the importance of emotional well-being as emotional well-being, which is an indicator of the success of emotional regulation of man [15, p. 61]. We agree with I. Rudenko's opinion, we believe that especially in stressful, affective situations, the subject must have the ability not only to constructively (environmentally) express emotions, but also to adequately ensure their self-regulation [13].

Regulation of emotions is carried out through the process of deploying regulatory efforts over time and depends on personal identity traits that are used to optimize their own emotional states [4]. Personality emotional regulation is a process aimed at managing and restraining one's emotional states. This process is characterized by the level of development of cognitive components of emotional regulation, features of emotion control, intensity and frequency of use of certain styles of protection against affective situations and the level of personal self-regulation [8, p. 67].

In foreign studies, much attention is paid to the study of strategies for regulating emotions in the context of mental and physical health. Many studies have focused on latent strategies for regulating emotions, ie on those strategies that occur within the individual, such as cognitive reassessment, suppression (A. Aldao, K. Dixon-Gordon [1]). Due to the fact that many different strategies of emotion regulation have been described in the psychological literature, but their relationship has been little studied, K. Naragon-Gainey and co-authors identified this relationship and clarified the structure of general strategies of emotion regulation [10]. A number of studies reveal the role of the environment in the regulation of emotions. In particular, E. Skinner, K. Edge, J. Altman, N. Sherwood state that the use of strategies of avoidance, escape, isolation, social isolation involves escape from an environment in which the individual does not receive support [14]. A small number of studies determine the features of the interaction of individual emotions and his self-regulation of the physical environment. Thus, J. Campos, S. Frankel, L. Camras identified the role of the environment in choosing a space in which the subject avoids situations that activate unwanted emotions, and chooses the space that determines the emergence of desired emotions. J. Gross, included in the author's model of emotion regulation the choice of situation and modification of the situation / environment in which the subject is, avoids or changes it, taking into account their probabilistic emotional impact [2]. K. Korpela and co-authors propose to include environmental strategies in the known strategies of emotion regulation. According to the authors, ecological strategies of emotion regulation are the use of natural and urban socio-physical conditions in order to regulate their own negative emotional states [9]. The role of nature in maintaining the well-being of the subject of life by means of regulating emotions is revealed in the research of M. Richardson [12]. In foreign scientific practice, there are also studies that reveal the characteristics of the influence of environmental factors on the frequency of use of certain strategies of emotional regulation. For example, according to J. Heiy, J. Cheavens, the subject more often uses the strategy of revaluation in those situations that are perceived as less important [6]. The need to understand the process of regulation of emotions and its consequences, using instant environmental assessment, is indicated

in D. Colombo and co-authors' works. In particular, researchers believe that this approach will allow individuals in real life to understand better the direct consequences for mental and physical health of using constructive / destructive emotional regulation strategies [7].

Theoretical analysis of the studied problem shows that scientists propose to consider emotional regulation through the process of regulatory efforts, taking into account the individual characteristics of the subject of life and environmental factors. Emphasis is placed on specific intellectual activity, which determines the choice of the subject to act in accordance with the environmental feasibility of mastering the affective situation. An important role in this process is given to emotional well-being, which depends on the frequency of use of constructive (environmental) strategies of emotional regulation to maintain environmentally oriented life.

Experimental part: 92 students of Vinnytsia State Pedagogical University named after Mykhailo Kotsyubynsky aged 19 to 21 of various first- and second-year specialties (87% – girls; 13% – boys) were diagnosed in order to study the peculiarities of emotional regulation strategies in ensuring ecologically oriented life. The study was conducted from September 2020 to May 2021 and provided for determining the initial indicators of the level of formation of strategies for students' emotion regulating, to determine the frequency of constructive (environmental) strategies for emotional regulation to maintain environmentally oriented life. At the ascertaining stage, a sample of the study was tested ($n = 92$) using the methods of «Cognitive regulation of emotions» (OKPE), N. Garnefski, W. Craig; Emotion Regulation Questionnaire (ERQ), J. Gross; «Personal styles of the subject's response to an emotional situation» (COPE), K. Carver, M. Sheyer, J. Weintraub; «Scales of emotional schemes», R. Leahy.

Results and discussion: Processing of OKPE test data (N. Garnefski, V. Kraig) showed that in a stressful situation young men and women prefer constructive strategies of emotion regulation: «positive reassessment» ($M = 14,1$), «focus on planning» ($M = 13,8$), «consideration in the future» ($M = 12,3$), «acceptance» ($M = 11,8$). The use of these strategies allows them to find a positive meaning in experiencing stressful, affective situations, which stimulates personal growth and new experiences of young people, promotes the possibility of forming environmentally oriented interaction with the environment. They seek solutions, think about possible options for action in a particular life situation, in general, try to manage a difficult situation and cope with its consequences. Using the strategy of «consideration in the future» allows you to reduce the exceptional importance of a negative situation by comparing it with other situations. Thus, the «sometimes worse» setting allows young people to reduce negative experiences. At the same time, the «acceptance» strategy allows young people to look at circumstances objectively, without distorting real events, and to develop a realistic plan of action in the long run.

Empirical data shows that students are less likely to use destructive strategies to regulate emotions: «rumination» ($M = 11,9$), «self-blame» ($M = 11,8$), «blame others» ($M = 9,8$), «catastrophization» ($M = 9,4$). The use of these strategies by young people provokes them to think about their emotions, which arose as a result of experiencing a stressful situation. Usually this process is cyclical and negative, because the focus of reflection is on negative feelings, which can induce new negative experiences and prevent constructive action in difficult situations, disrupt the ecological balance with the environment. In the case of a negative solution to the situation, the person feels guilt, which reduces self-esteem and motivation to act. Less often, adolescents tend to attach great importance to negative events that happen in their lives and shift responsibility, blame for the consequences on someone else. The use of destructive strategies in coping with stressful situations leads to negative experiences, the strength and duration of which depends on the context of the situation, but they clearly prevent young people from maintaining an environmentally oriented life.

The generalization of empirical data according to the method of ERQ (J. Gross) allowed us to draw the following conclusions: the indicator «cognitive reassessment» has a high rate in 45,2% of respondents. Using this strategy allows young people to change their attitude to the situation, which leads to a modification of the emotional response. On the other hand, according to the indicator «suppression of expression» we state high data in 41,9% of respondents, which indicates the leveling of manifestations of emotions by students after the emotion is experienced. That is, such Young men and young women show emotion only at the level of somatic reaction, which negatively affects their mental and physiological state, as well as the ability to maintain ecological balance with the living environment.

The study of personal styles of the subject's response to an emotional situation according to the method of SORE (K. Carver et al.) allowed to determine the frequency of youth use strategies to cope with stress, namely: «positive reformulation» ($M = 11,2$), «active overcoming» ($M = 11,1$), «use of emotional social support» ($M = 10,7$) and «use of instrumental social support» ($M = 10,5$). According to the results of the diagnosis, young men and women often use constructive strategies, and therefore they are able to perceive positively stressful

events, which help them not only to overcome adversity, but also to transform negative experiences to their advantage. The position of actively overcoming life's adversities promotes rapid adaptation and the ability to direct their activities in a constructive direction. The authors of the methodology note that this involves significant costs of internal and external resources, and with low resource intensity of the individual can lead to depletion of the resource base and possible burnout in the subsequent stressful situations. Our sample needs emotional social support, which is realized through the exchange of feelings, thoughts and actions, aimed at meeting the need to improve emotional state during stressful situations. It is obvious that young people in difficult life situations need to be supported "by word and deed" from others, as a result of which it is possible to shift responsibility to others in order to alleviate the impact of negative experiences by receiving help. We assume that such young people will find it difficult to develop independence and resilience, willpower and the ability to use their own internal resources in stressful situations, which can negatively affect the maintenance of environmentally oriented life.

The least used strategies are «behavioral avoidance» ($M = 7,8$), «denial» ($M = 7,7$), «use of psychoactive substances» ($M = 5,8$). These strategies for regulating emotions involve a passive position in terms of activities; this behavior is often characterized as laziness or procrastination, although it aims to reduce emotional discomfort in the short term, but in the long run it will lead to the accumulation of problems that will only worsen the emotional state of young people. Denial blocks access to relevant information, so a constructive analysis of the situation, based on which you can develop an effective plan to overcome, is simply impossible. As a result, the emotional state of the subject only worsens, unresolved issues only become more, the stressfulness of events increases. In the short term, the use of psychoactive substances improves, but it negatively affects the health, social relationships and future of the individual. The obtained empirical indicators indicate a moderate level of use of such a strategy, but still destructive consequences are present. Thus, although Young men and young women in stressful situations are more prone to constructive strategies of emotional regulation, the fact that they tend to use destructive strategies is worrying because they do not encourage them to maintain environmental relationships with the environment.

The study of behavioral strategies used by young people in response to their own emotions and the emotions of others, using the method of «Scale of emotional schemes» (R. Leahy) showed that for our sample dominant strategies are «devaluation of emotions» ($M = 8,4$), «Low emotional expressiveness» ($M = 8,3$), «simplified perception of emotions» ($M = 7,9$), «insufficient coordination of their own emotions with the emotions of others» ($M = 7,5$). Young men and young women do not attach importance to their own emotions, regardless of modality, they are not always able to focus on their own condition and reflect on their emotional reactions, and therefore they have a desire to quickly get rid of their experiences by switching to some activity. Some young people have difficulty constructing the emotions they are experiencing. Obviously, most young people do not have fully mature and constructive interpersonal strategies. Their implicit interpretations and expectations of their own and others' emotions are incomplete or distorted. Thoughts about one's own and others' emotions may not be objective.

In order to identify the specifics of the strategies for adolescents' emotion regulating in stressful situations, we used the program SPSS 17,0, in particular the Pearson correlation coefficient. The obtained results allowed characterizing the studied indicators in more detail. The existence of a correlation between the indicators of constructive strategies of emotion regulation and behavioral strategies, personal styles of the subject's response to an emotional situation was stated. The indicator «cognitive reassessment» has a positive correlation with indicators of response style «focus on emotions» ($r_{xy} = 0,405$, $p \leq 0,01$), behavioral strategy «insufficient coordination of their own emotions with the emotions of others» ($r_{xy} = 0,321$, $p \leq 0,05$) and negative correlations with indicators «denial» ($r_{xy} = -0,367$, $p \leq 0,05$), «behavioral avoidance» ($r_{xy} = -0,329$, $p \leq 0,05$), «reduction of guilt for their own emotions» ($r_{xy} = -0,307$, $p \leq 0,05$). Focusing young men and women on emotions, their active expression, acceptance, not denial, regulation of efforts to interact with stressors allows you to interpret better the emotional situation in order to manage emotions, increase the environmental friendliness of their own interaction with the environment. At the same time, a change in attitude to the situation modifies the primary emotional response of the individual, as a consequence – the modified emotional response is different from the reaction of other participants, reacting directly and probably impulsively. There was also a positive correlation between the «acceptance» strategy and the «self-restraint» response style ($r_{xy} = 0,340$, $p \leq 0,05$). That is, young people can accept and realize a stressful situation when they are able to restrain themselves from hasty and impulsive actions. It was found that «focus on planning» can occur only when young people are able to

«positively reformulate events» ($r_{xy} = 0,356, p \leq 0,05$), «use instrumental social support» ($r_{xy} = 0,340, p \leq 0,05$) and reduces the use of the «negative» response style ($r_{xy} = -0,359, p \leq 0,05$). Therefore, adolescents' thoughts on the next steps in overcoming a stressful situation are possible in the case of rethinking the stressful situation in a positive way, receiving advice, help from adults (obviously parents), peers, acceptance, not denial.

Let's analyse the features of the use of destructive strategies for regulating the emotions of young people. There is a positive correlation between «self-blame» and «positive refocusing of the event» ($r_{xy} = 0,313, p \leq 0,05$), «focus on planning» ($r_{xy} = 0,454, p \leq 0,01$), «use of instrumental social support» ($r_{xy} = 0,358, p \leq 0,05$), «use of social emotional support» ($r_{xy} = 0,357, p \leq 0,05$), «active overcoming» ($r_{xy} = 0,502, p \leq 0,01$), «use of humor» ($r_{xy} = 0,299, p \leq 0,05$) and a negative correlation with the response style «behavioral avoidance» ($r_{xy} = -0,328, p \leq 0,05$). Young men and young women tend to blame themselves for failures if they do not know how to act in difficult life circumstances, expect advice, help, emotional and moral support, compassion, abandon the goal without making an effort to overcome stressors. Positive correlation with «rumination» and response styles «use of instrumental social support» ($r_{xy} = 0,452, p \leq 0,01$), «use of social emotional support» ($r_{xy} = 0,395, p \leq 0,01$) and negative correlation the connection with «denial» ($r_{xy} = -0,338, p \leq 0,05$) indicates that young people tend to get stuck in affectively coloured experiences (especially in situations of waiting for outside sport), do not want to really perceive and adequately respond to stress situation. Positive correlation between «catastrophization» and «denial» ($r_{xy} = 0,426, p \leq 0,05$), «use of psychotropic substances» ($r_{xy} = 0,313, p \leq 0,05$) and negative correlation with the strategy of «use humor» ($r_{xy} = -0,348, p \leq 0,05$) shows that in a stressful situation, young men and women tend to exaggerate the size and consequences of the event, and to cope with negative emotions, can as a way to avoid the problem and to reduce emotional stress alcohol or other psychoactive substances.

Conclusions: Emotional regulation is considered through the process of regulatory efforts, taking into account the individual characteristics of the subject of life and environmental factors. Emotional regulation of personality is a process aimed at managing and restraining one's emotional states. Its effectiveness depends on the level of development of cognitive components of emotional regulation, intensity and frequency of personal use of certain styles of protection against affective situations. When mastering affective situations, specific intellectual activity is carried out, which determines the choice of the individual to act accordingly / not in accordance with environmental expediency. In order to maintain ecologically oriented life activities, it is important for a person to use constructive (ecological) strategies of emotional regulation.

Young men and young women in stressful situations prefer constructive strategies of emotion regulation, which help to find a solution, master a difficult situation and cope with its consequences. At the same time, the use of destructive strategies in coping with stressful situations leads to the emergence of negative experiences, the strength and duration of which depends on the context of the situation. However, it should be noted that such destructive experiences prevent young people from maintaining environmentally oriented activities.

Prospects for further research: Prospects for the study of strategies of emotional regulation of personality, we see the need to study the impact of environmental factors on the ability to constructively regulate the individual's own negative emotional states.

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THE INFLUENCE OF THE EDUCATIONAL ENVIRONMENT ON THE PSYCHOLOGICAL WELL-BEING OF STUDENT YOUTH

Abstract. *The article analyzes the features of the impact the educational environment on the psychological well-being of student youth. A psychological analysis of the content the educational environment and the essence of the phenomenon of "psychological well-being". The relationship between the psychological well-being of student youth and the psychological characteristics the educational environment is determined. It is stated that the psychological well-being of student youth largely depends on the level of development and quality of the educational environment. It is established that external objective indicators of well-being, such as criteria of success, indicators of health, material well-being, do not affect a person's experience of well-being. Psychological well-being is basically subjective, it is largely due to the special attitude of the individual to himself, the world around him and its individual parties. It is determined that a favorable psychological atmosphere in the educational environment is important for student youth. The more opportunities there are in the educational environment to seek help, the higher the protection against psychological violence, threats, ignoring and hostility from teachers and public humiliation from classmates, the higher the level of student self-acceptance. It is stated that the importance of correct and safe interaction of the subjects of the educational environment is a significant factor in maintaining a high level of psychological well-being of student youth.*

Keywords: *educational environment, subjects of educational environment, psychological well-being, student youth.*

Formulation of the problem. The problem of the influence of the educational environment on the development and formation of personality remains one of the priorities in modern psychological science. In this context, the study of the characteristics of the educational environment related to the psychological well-being of the subjects of the educational environment becomes an urgent task. The educational environment affects the psychological well-being of the individual, and psychological well-being is an indicator of the quality of the educational environment. An important influence is exerted on various parameters of the mental state of the individual and, as a consequence, on the success of behavior, productivity, effectiveness of interpersonal interaction. The development of personality in the educational environment involves its formation as a creator and designer of his life, who is able to make independent decisions, be responsible for them,

Analysis of recent research and publications. The subject of scientific discussions remains the use of related concepts of subjective and psychological well-being, as these constructions are devoted to the largest number of theoretical and practical studies in domestic psychological science, there is no consensus: (K. Riff, E. Diner), others believe that, on the contrary, psychological well-being is part of the subjective (N. Bakharev, L. Kulikov, M. Sokolov, etc.). Attempts are also made to synthesize these concepts, where subjective and psychological well-being act as synonyms (N. Bradburn, O. Panina, etc.).

Note that, despite the discussions of modern researchers, the multidimensional model of psychological well-being and methods of diagnosing its components, developed by K. Riff, are most popular in both theoretical and applied research. According to A. Baturin and colleagues, the main achievement of K. Riff is the concept of positive functioning of the individual as the main core of well-being, as a result it was found that a specific combination of personal characteristics can act as an internal factor of well-being [2]. In the development of this idea, the authors also note that the composition of qualities that determine the positive functioning of the individual is incomplete and can be expanded. Scientists distinguish cognitive and emotional components (components of psychological well-being) (L. Kulikov, I. Dzhidaryan).

Despite different approaches in research, most authors consider psychological well-being as a specific phenomenon - an integrative formation that has a complex, dynamic, multicomponent structure. The psychological well-being of student youth depends on many factors. In particular, from the educational environment as a system of specially organized conditions that have a significant impact on personal development. The educational environment is a set of opportunities not only for learning, but also for the

manifestation and development of abilities, personal potential of its subjects and affects the system of interpersonal relations, professional development. (I. Baeva, O. Laktionova, V. Panov, V. Slobidchikov, V. Yasvin, etc.) In general, it can be noted that, despite the existing difficulties of differentiation, the above phenomena unites one value vector - the search for ways to improve the quality of human life [2; 6].

Unresolved aspects of the problem. Despite the fact that recent years have been characterized by researchers' attention to the problems of the educational environment and psychological well-being, often the authors' approaches to determining the content, structure, goals are narrow, focusing on individual, important but local aspects of these phenomena. Theoretical and methodological analysis of the works showed that the problem of the impact of the educational environment on the psychological well-being of modern youth remains out of the attention of scientists.

The study of the relationship between the psychological characteristics of the educational environment with the psychological well-being of student youth concerns the improvement of the quality of life of the subjects of the educational environment.

Note that many authors point to the importance of influencing the formation of professional and personal qualities of student youth environmental factors, but they are studied to a much lesser extent than the influence of internal factors such as intelligence, creativity, motivation.

The purpose of the article - to theoretically analyze and empirically establish the relationship between the characteristics of the educational environment and indicators of psychological well-being of student youth.

Scientists note that well-being is a generalized concept, a multifactorial construct that includes categories from different spheres of life [3; 7]. The meaning of the concept of "well-being" largely coincide in scientific interpretations and in everyday consciousness. It should be noted that external objective indicators of well-being, such as success criteria, indicators of health, material well-being, do not affect a person's experience of well-being. The experience of well-being is basically subjective, it is largely due to the special attitude of the individual to himself, the world around him and its individual parties. personal growth (effective use of personality traits, talent development); self-acceptance (self-recognition, positive attitude to their personality traits).

The initial basis for understanding the meaning of the term "educational environment" is that the mental development of man in the learning process should be considered in the context of "man - the environment". Education, upbringing and development are significantly determined by socio-cultural conditions, subject-spatial environment, the nature of interpersonal interaction and other environmental factors. Analysis of the educational environment in terms of the nature of environmental influences as they have a developmental effect, take into account the different needs and interests of the individual, promote its vital self-determination and self-realization allows us to talk about developmental, personality-oriented environment. The educational environment of the university is a set of material factors of the educational process and human relations, which establish the subjects of education in the process of their interaction. Depending on the combination of components of the educational environment, the level of their development and coherence, we can assume different options for the realization of personal potential. That is why one of the most important tasks of higher education institutions is the organization of such links between students and the educational environment, which optimally influence individual development, promote professional development. In this sense, we emphasize the importance of creating a variety of opportunities in the educational environment for student youth. It is the proposed opportunities that emphasize the active beginning of the subject who is mastering the educational environment. Opportunity is a "bridge" between the subject and the environment and is defined as a property of the environment, and the property of the subject. Studying and modeling the educational environment of the university, it is necessary to pay attention to the following fundamental points: the interaction and interaction of the social environment and the university educational environment; subjects of the educational environment of the university: the system-creating role of the teacher, the active position of the student. A. Yasvin paid special attention to the interaction and interaction of the social environment and the educational environment [10.p.186]. He emphasizes the role of teachers in creating an educational environment not only inside the school but also outside. In this sense, the educational environment of the university has a special mission. A special environment of partnership between educational institutions in the region is created, a single educational space is formed, in which the degree of coordination of relations depends on the successful social mobility of teachers and students, residents of the region in general.

It is no longer a debatable issue that the educational environment is a very capacious and systematic concept. Due to this, the phenomenon of the psychological component of the educational environment is

ambiguous and has a multifactorial conditionality. The weight of all factors that in one way or another affect the psychological quality of the educational environment, it is difficult to take into account, but to identify some system-forming is quite possible [4]. The psychological component of the educational environment can be described through the following characteristics: attitude to the educational environment, satisfaction with the main characteristics of interaction and protection from psychological violence [1].

In our study to determine the level of psychological well-being and its components used the method of "Scale of psychological well-being K. Riff" (adapted by SV Karskanova) [5]. Additionally, the "Scale of subjective well-being" (A. Perrudet-Badoux, G. Mendelssohn and J. Chiche, adapted by MV Sokolova) was used [9], which allows to identify the level of emotional comfort. The methodology contains six clusters, the content of which is related to emotional state, social behavior and physical symptoms, which allow to assess the quality of emotional experiences of subjects ranging from optimism, cheerfulness and self-confidence to depression, irritability and loneliness. together with the six components of the methodology to. This will allow Riff to expand his understanding of the peculiarities of the psychological well-being of student youth.

The method allows to assess the educational environment of the institution by three main characteristics:

- 1) attitude to the educational environment (reference);
- 2) satisfaction with the significant characteristics of the educational environment of the school;
- 3) protection from psychological violence in interpersonal interaction.

The research was conducted on the basis of Vinnytsia State Pedagogical University named after Mykhailo Kotsyubynsky; sample description: 132 students majoring in 053 Psychology (97 girls and 35 boys) took part in the study.

To achieve this goal, we carried out: analysis of empirical data: description of the psychological characteristics of the educational environment in the assessments of students; identified differences between students with different levels of psychological well-being; analysis of the results of correlation psychological characteristics of the educational environment and indicators of psychological well-being of student youth.

Students rated their attitude to the educational environment as positive, the average score of the answers - high. This indicates a high reference value of the educational environment for students, mutual understanding and friendly relations between the subjects of the educational environment (classmates, teachers, administration), student involvement and positive attitude to the learning process as a whole.

The degree of satisfaction with the significant characteristics of the educational environment, the level of protection from psychological violence in interpersonal interaction are also high. a low level of standard deviation confirms sufficient homogeneity of the group. The results indicate a high level of psychological safety and comfort of the educational environment, which gives reason to believe that the psychological component of the educational environment of the university is sufficiently unified, and this allows further analysis to consider the data as a whole. We studied the level of psychological and subjective well-being of student youth. for further analysis, the sample was divided into 2 groups:

The data presented in Table 1 show that our selected groups showed significantly significant differences in Student's t-test for all indicators of psychological well-being.

Table 1

The level of psychological well-being of students

Indicator of psychological well-being	A group with a high level $\bar{x} \pm \delta$ (Bali)	Low level group $\bar{x} \pm \delta$ (Bali)
psychological well-being	267.00 $\pm$ 25.23 ***	312.60 $\pm$ 23.20 ***
interpersonal interaction	56.30 $\pm$ 8.21 ***	41.67 $\pm$ 5.72 ***
autonomy	61.91 $\pm$ 8.87 ***	51.40 $\pm$ 6.99 ***
environmental management	63.73 $\pm$ 8.46 ***	35.60 $\pm$ 6.68 ***
personal growth	64.70 $\pm$ 6.99 ***	54.49 $\pm$ 7.51 ***
goals in life	58.11 $\pm$ 7.31 ***	42.36 $\pm$ 6.97 ***
self-acceptance	53.13 $\pm$ 7.86 ***	36.97 $\pm$ 7.86 ***

The table shows that the highest values in both groups showed the indicator "Personal Growth", which indicates the desire of student youth for development and self-realization. Such students are open to new

experiences, trying to realize their own potential. In the group with a high level of psychological well-being, the lowest values of the indicator "Autonomy", which indicates the importance for students of the views of parents and teachers. In the group with a low level of psychological well-being, the lowest values of the indicator of "self-acceptance", which indicates the internal dissatisfaction of students with themselves.

Students with a high level of psychological well-being can be described as having positive relationships with others, capable of empathy, independent and autonomous decisions, they are able to find opportunities to meet their own needs, able to influence others. Such students strive for self-development and self-realization, have clear goals for the future and are capable of planning. in general, they evaluate themselves positively and accept their strengths and weaknesses.

Students with low levels of psychological well-being have limited contact with others, find it difficult to be open and empathetic, and rely on other people to make important decisions, but they are less dependent on others for their opinions and achievements. are able to make independent decisions, but have difficulty in organizing daily activities, do not feel the strength and ability to change the situation, show interest in the activity, but do not set a goal. not inclined to be aware of their own changes and strengths, more focused on the mistakes and failures of the past.

Analyzing the indicators of subjective well-being (emotional comfort) of student youth in the educational environment (see Table 2). The obtained data show that on all scales of subjective well-being there are significant differences between groups, which confirms the legitimacy of the division of students by level of well-being into 2 groups - psychologically well-off and psychologically disadvantaged students (standard deviation in both groups). .

The results of the study showed that students with a high level of psychological well-being in all indicators have high values, except for the indicator "tension and sensitivity", which revealed average values. This means that such students are in a good mood, do not feel tension in learning, treat it with interest and enthusiasm. Such students do not experience significant emotional problems, are optimistic, active and confident, are able to build relationships with others and manage their own behavior, they easily seek help from their social environment, satisfied with their health and daily life.

Table 2

The level of subjective well-being of students

Indicator of subjective well-being	A group with a high level $\bar{x} \pm \delta$ (Bali)	Low level group $\bar{x} \pm \delta$ (Bali)
subjective well-being	78.33 $\pm$ 11.56 ***	42.91 $\pm$ 12.54 ***
tension and sensitivity	10.73 $\pm$ 3.11 ***	8.25 $\pm$ 3.20 ***
signs that accompany the main psycho-emotional symptoms	20.37 $\pm$ 4.52 ***	14.10 $\pm$ 4.29 ***
mood swings	11.88 $\pm$ 1.75 ***	8.14 $\pm$ 2.61 ***
the importance of the social environment	15.13 $\pm$ 3.19 ***	10.63 $\pm$ 3.30 ***
self-assessment of health	9.52 $\pm$ 2.84 ***	7.35 $\pm$ 3.04 ***
degree of satisfaction with daily activities	9.69 $\pm$ 3.34 **	8.22 $\pm$ 3.41 ***

Students with a low level of well-being have average values for all indicators of emotional comfort, and for the indicator "signs accompanying the main psycho-emotional symptoms", high values are found, such students often experience negative feelings, may feel uncomfortable in the educational environment, have difficulty in relationships as with teachers and classmates, and with close surroundings. They experience states of misunderstanding and loneliness, need solitude, but they have no psycho-emotional symptoms. They experience boredom in everyday activities, do not see positive aspects in it, and are often in a low mood.

We used correlation analysis to identify and analyze the relationships between the psychological characteristics of the educational environment and indicators of psychological well-being of students. As a result of correlation analysis, four main system-forming components were identified: "Positive relationships with others", "Personal growth", "Degree of satisfaction with daily activities" and "Psychological well-being". The first three components are interconnected through a number of indicators of protection from psychological violence in the educational environment.

"Positive relationships with others" are related to satisfaction with the educational environment and its characteristics, such as relationships with teachers and awareness of difficulties and problems, as well as an indicator of protection from ignorance in interpersonal interaction.

"Personal growth rate" is related to the indicators "opportunity to show initiative and activity" and "protection from ignorance and hostility" by teachers and classmates. This indicates the need for students in a safe educational environment where you can make mistakes without fear of being ridiculed - these are the conditions necessary for professional and personal development. Protection from ignorance and need on the part of teachers is interrelated with the indicator of satisfaction with daily activities, which is related to the emotional component of attitude to the educational environment and the component of emotional comfort "tension and sensitivity". Subjective well-being as an indicator of emotional comfort is also associated with protection from being ignored by peers. The results obtained indicate that

Educational institutions (colleges, universities) today are not the only source of knowledge, so it is extremely important to form positive relationships between the subjects of the educational environment. The results of the study show how important a favorable psychological atmosphere in the educational environment is for student youth. The more opportunities there are in the educational environment to seek help, the higher the protection against psychological violence, threats, ignoring and hostility, the higher the student's level of self-acceptance. The psychological well-being of student youth is positively interrelated with the preservation of personal dignity, taking into account personal problems and difficulties, protection from coercion and hostility. Emotional comfort in the educational environment associated with the preservation of personal dignity and protection from psychological violence. The obtained relationships confirm the importance for students of positive relationships between them and teachers. It can be assumed that students with a high level of psychological well-being see their social environment as one that is designed to promote their professional and personal development. The self-acceptance of student youth is largely related to the recognition of their academic achievements, an objective assessment of which can be obtained not only from teachers but also from classmates, which is designed to promote their professional and personal development. The self-acceptance of student youth is largely related to the recognition of their academic achievements, an objective assessment of which can be obtained not only from teachers but also from classmates.

Conclusions. The study shows the importance of correct and safe interaction of the subjects of the educational environment, which is a significant factor in maintaining a high level of psychological well-being of student youth. The results of empirical research confirm the existence of relationships between the psychological well-being of student youth and the psychological characteristics of the educational environment. The influence of psychological characteristics of the educational environment on the level of psychological well-being of student youth was also revealed. It was found that gifted adolescents significantly differ in the level of psychological well-being. For gifted adolescents with a high level of psychological well-being, the most important thing is protection from humiliation by teachers and classmates, it is important to recognize their academic achievements,

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USE OF PSYCHODRAM AS AN ECOPSYCHOLOGICAL METHOD OF OVERCOMING BARRIERS OF INTERPERSONAL COMMUNICATION IN DISTANCE LEARNING

Recent research suggests that the need for communication is realized in today's youth with certain psychological difficulties due to communication barriers, which in turn may be exacerbated by distance learning and require environmental and effective methods of overcoming.

The article provides a theoretical analysis of the current state of the problem of barriers to interpersonal communication that arise in the context of distance learning. Interpersonal communication is an important and integral part of the life of each individual, barriers that may arise in the process - will significantly affect the emotional and psychological well-being of the individual.

Much attention is paid to distance learning, its features and specifics are analyzed. It is revealed how distance learning affects the psycho-emotional state of the student.

The article considers and analyzes such phenomena as virtual communication and Internet addiction. The peculiarities of partner choice and the specifics of building interpersonal interaction in the process of virtual communication are determined. Research into the phenomenon of Internet addiction has revealed its possible causes and the negative consequences it causes: neglect of family and friendly responsibilities, feelings of emptiness, depression, hiding the truth from family members, problems with learning.

The results of an experimental study of barriers to interpersonal communication, the dominant barrier and the extent of its impact on everyday communication are highlighted. The levels of Internet dependence of respondents were also studied. The results of the study of the levels of subjective experience of loneliness are demonstrated. Statistical data processing was performed in order to identify correlations between the studied phenomena.

The expediency of using the method of psychodrama as one of the most effective methods of overcoming barriers to interpersonal communication is proposed and substantiated. Psychodrama is a method of group psychotherapy, which consists in acting out by members of a psychotherapeutic group scenes from their lives, in which, in particular, conflict or traumatic situations can be reproduced.

Key words: *interpersonal communication, barriers to interpersonal communication, Internet addiction, loneliness, personality, environmental friendliness, psychodrama.*

Introduction. Interpersonal communication and interaction are essential parts of human life, an important prerequisite for psychological health and self-fulfillment, the basis of all activities and human relationships. The present of modern youth is characterized by a decrease in the quantity and quality of interpersonal interaction. Particularly acute is the problem of barriers to interpersonal communication for participants in the educational process, who are forced to accept the challenges of today and move to remote work.

In such conditions, the information and educational environment fills all spheres of life of young people. The transition to distance learning significantly complicates the process of adaptation to rapid and ever-changing living conditions. As a result, a significant number of young people can not effectively and efficiently build interpersonal interaction with others, as a result of which they may experience negative psycho-emotional states.

One of the most effective in working with barriers to interpersonal communication and the development of spontaneity, willingness to act in unforeseen circumstances is the method of psychotherapy and psychological counseling - psychodrama, developed by J. Moreno.

Psychodramatic techniques in dealing with the problems of barriers to interpersonal communication allow a person to develop the ability to successfully cope with today's challenges, not to give up new and unusual in life, to be spontaneous and creative in making their own decisions.

Psychodrama as a method, in contrast to long-term psychotherapeutic areas, allows you to quickly identify and change existing inappropriate and ineffective behavioral patterns that provoke barriers to communication, as well as develop new, productive ways to build and maintain interpersonal communication, especially in distance learning.

Purpose of the research: explore the features of barriers to interpersonal communication of students in distance learning and develop a program to overcome barriers to interpersonal communication using psychodrama techniques online.

The objectives of the research: to analyze the specifics and features of interpersonal communication in terms of distance learning; to study the psychological features of barriers to interpersonal communication in the context of distance learning; develop a program to overcome barriers to interpersonal communication in the context of distance learning using the methods of psychodrama.

Theoretical basis of the research. Peculiarities of interpersonal communication were studied in works of H. Andrieieva, B. Lomov, A. Bodalov, V. Kazmirenko, A. Petrovskyi, B. Paryhin, N. Chepeleva, L. Orban-Lembryk, A. Brudnyi, E. Bern, D. Maiers, M. Meskon, M. Albert, F. Hedouri etc.

Psychological aspects of distance education and design of distance development environments were studied by foreign (H. Bekker, V. Hasson, etc.) and native (Yu. Balashova, N. Bahdasarova, I. Bohdanov, I. Vasylieva, Yu. Mashbyts, M. Smulson et al.) scientists.

Transformation of the method of psychodrama in the conditions of remote mode are engaged by C. Bingol, M. Gasso, S. Giacomucci, J. Shpirer, T. Komar, A. Kylivnyk etc.

Psychological aspects of distance education and the use of information technology were studied by Yu. Balashova, N. Bahdasarova, I. Bohdanov, V. Demkin [1, 2, 6].

The design of remote development environments was studied in works of Yu. Mashbyts, M. Smulson, O. Stavtshyi etc. [7].

M. Smulson notes that «with adequate organization of student activities in the virtual educational space (distance learning) intellectual and personal self-development can be considered as its direct product: the subject designs the structure and characteristics of his intelligence, sets appropriate goals and reflects as opportunities environment, and the actual process of self-development» [9].

V. Demkin identifies a number of psychological principles that affect the quality of distance learning. He pays special attention to the need for detailed planning of educational activities, its organization, clear setting of goals and objectives of education. Students must understand the purpose of the courses offered. The author notes that the effectiveness of students' learning activities largely depends on the content of the material, which determines the structure and level of their cognitive interests - general or special [7].

It is becoming increasingly clear that the process of interaction of the individual with global information networks affects his psyche, limits it in interpersonal communication, deprives him of the opportunity to show spontaneity and creativity. That is why it is so important during distance learning to develop personal qualities that will help the student to overcome barriers to interpersonal communication and focus on their own strengths, providing the student with psychological comfort.

Modern American psychologists P. Watzlawick, J. Beavin, D. Jackson in the work «Pragmatics of Human Communications» identified the most important features of interpersonal communication [4]:

1. Inevitability of communication - everyone communicates, in case a person does not want to communicate with someone, yet he becomes a source of information for others, and thus, is included against his will in universal communication.

2. Necessity of communication - information messages in communication creates new mental states of those who perceive it, or even new situations.

3. Dual aspect of communication - a description of the real (or what is considered real) world understood by the participants of communication. At the same time, they describe the relationships between them: socio-role, psychological, spiritual, and so on.

4. Mutual adaptation of participants - coordination of verbal and nonverbal codes of communicators, which may differ significantly. It is not only about different languages, but also about the specific use of the language code of the idioethnic language (idiostyle) common to the speaker and listener, due to different social, age, gender, cultural and other factors.

5. Punctuation of events - the introduction of each of the participants in the communication of their vision of the sequence, order of events, causes and effects, incentives and reactions, and so on. All this can lead to various interpersonal conflicts. Scientists argue that the nature of relationships depends on the punctuation of communicative sequences between participants.

6. Symmetry or complementarity: symmetry is based on the principles of equality, recognition of each of the participants in the uniqueness of the other; complementarity is based on opposite principles: one of the participants dominates, the other is in the position of the dependent. All communicative exchanges are either symmetrical or complementary, depending on whether they are based on similarities or differences [4].

Given the above features of interpersonal communication, the study of changes in their specificity in terms of distance learning, namely the study of virtual communication and Internet addiction, is particularly noteworthy.

The study of the situation of communication using the global Internet is based on the theories of communication proposed by such psychologists as R. Nemov, A. Dobrovych, N. Asmus, O. Goroshko, O. Butorina. Virtual communication - indirect communication, based on the special need for contact with other subjects, but does not involve direct visual and physical contact with them. The concept of «virtual reality», in which virtual communication takes place, means that: «despite the similarities, even the naturalness of some simulated virtual realities, the virtual user still understands that the events of virtual reality unfold only within his consciousness, which does not exist in the physical sense. This provides a sense of security, distancing oneself from the events of virtual reality». Due to the fact that the partner in virtual communication is a priori invisible, the criterion of physical appearance ceases to play a dominant role and the emphasis is on the similarity of attitudes, beliefs and values. Such features of communication in a virtual environment are a prerequisite for the emergence of a sense of emotional closeness between communication partners, focusing on the spiritual world of the interlocutor.

In turn, the spiritual closeness and kinship of the virtual interlocutor, the reduced importance of the external factor, will significantly increase the need for such communication, and consequently increase its number. Unrestricted and unregulated virtual communication can lead to Internet addiction.

Research into computer addiction has been conducted since the early 1990s. However, the term «Internet addiction» was suggested by a psychologist I. Goldberg in 1995 to describe the pathological urge to use the Internet [10]. Diagnostic criteria for the disorder generally meet the DSM-IV criteria for non-chemical dependencies:

- 1) the use of a computer causes distress;
- 2) the use of a computer harms physical, psychological, interpersonal, family, economic or social status.

In another work, I. Goldberg characterizes the Internet - addiction as one that has a detrimental effect on domestic, educational, social, professional, family, financial or psychological spheres of activity. I. Goldberg tends to use the term «pathological computer use» (PCU).

M. Orzack identified psychological and physiological symptoms characteristic of PCU [12]. In particular, she attributed psychological well-being or euphoria at the computer, inability to stop, increasing the amount of time spent at the computer, neglect of family and friendly responsibilities, feelings of emptiness, depression, irritation outside the computer, hiding the truth from employers or family members about their computer activities, problems with work or study.

PCU is now used for a wider range of disorders, and the term «Internet addiction» is used to refer to the pathological use of computers to engage in social interactions.

Among the studies devoted to the analysis of the characteristics of the Internet environment as factors of Internet dependence, there are works A. Minakov, V. Burova, K. Joun.

A. Minakov sees the Internet as a new layer of reality, characterized by much less rigid barriers and restrictions and allows a much greater degree of freedom for its «inhabitants». Also its feature is mythological - the Internet resembles a fairy tale in which the «user» has supernatural abilities, in contrast to real life. These properties of the virtual environment contribute to a significant regression of users, which is the secret of its extreme attractiveness [8].

V. Burova considers the Internet - addiction as a means of escaping from reality, highlighting as its factors:

- the possibility of anonymous social interactions (here, a sense of security in the implementation of interactions, including the use of e-mail, chats, messengers, etc.);
- the ability to realize fantasies with feedback (including the ability to create new images of «I»; the realization of fantasies that can not be realized in the ordinary world, such as cybersex, role-playing games in chats, etc.);
- extremely great opportunity to find a new interlocutor that meets almost any criteria (it is important to note that there is no need to keep the attention of one interlocutor - because at any time you can find a new one);
- unrestricted access to information («information vampirism») (last on the list, as the danger of becoming addicted to the Internet lies in wait for those for whom computer networks are almost the only, and sometimes the only means to meet the need for communication).

K. Joung in the course of further search for potential explanations for the pathological use of the Internet, identified four main factors of the Internet - dependence, which were identified on the basis of content analysis [14]:

1) Social support. Despite the fact that communication remains usually textual, the exchange of words has a deep emotional color. Personal boundaries are very shaky, as the rules of good manners do not apply in cyberspace and at the first opportunity ask about age, marital status and other personal details. This allows you to very quickly move to close, intimate communication. Also, involvement in the virtual community due to its support and at the same time anonymity also allows you to discuss controversial topics - religion, sexual relations, etc. with less risk. At the same time, the growing distance between people increases the need for social acceptance and support that the virtual community can provide.

2) Sexual realization. K. Young identifies three basic causes of sexual Internet addiction: The availability of pornographic servers and communication rooms on sexual topics is an important part of the problem. Control - Virtual sex offers an anonymous environment that allows you to abandon everyday ways of sexual intercourse and try to reveal your hidden fantasies without fear of being punished. Arousal is related to the ability to freely explore human sexuality in cyberspace. The interactivity of virtual sex allows people to feel that others are noticing their sexuality.

3) Constructing identity. In reality, socio - economic status, gender, age and race play a role in constructing the identity on which interpersonal communication is based. In virtuality, all these parameters take a back seat, and all users become equal. As a result of the lack of social identity on-line, it becomes possible to create a virtual personality.

4) Detachment of personality. According to psychoanalytic theory, suppressed desires are contained in the unconscious and can manifest in dreams or reservations. Virtual reality, thanks to its anonymity and some similarities with the reality of dreams, opens a new space for their realization. Depressed parts of the psyche can manifest in different ways - the shy become impudent, and the passive and soft - aggressive.

A. Shaidulina considers Internet addiction as a new form of addictive behavior, citing some features of adolescents with Internet addiction: disharmony of the emotional sphere, manifested in the inability to clearly differentiate their feelings, the inability to spontaneously respond to them in communicative situations; tendency to social isolation [5].

In own research, E. Hubenko focuses on the difficulties of interpersonal communication Internet - addicts. It was found that addicts are characterized by a lower level of self-confidence and courage in social contacts [5].

That is, in the research of many authors, the Internet - addicts appear anxious, depressed, timid in social contacts; however, some researchers (J. Greenfield, M. Greffits, J. Suler) believe that their defining characteristics are a high level of abstract thinking, individualism, willingness to be satisfied with indirect contacts with others, not prone to conformism, they feel «pioneers» in «unknown territory». The ability to constantly replenish knowledge and learn new activities - the source of their self-esteem [cit. according to A. Voikusynskyi]. But at the same time it is accompanied by the emergence of concomitant problems in the form of anxiety, low levels of empathy, difficulty managing emotions, and others. Which, in turn, is the cause of communication barriers, and affects the daily interpersonal communication.

Developed by the American psychologist and psychiatrist J. Moreno, the method of psychodrama is one of the successful methods of adapting to new conditions and overcoming barriers to interpersonal communication. For J. Moreno, psychodrama was a real «temple of theater», which releases spontaneity, enriches and balances the role repertoire of the individual, explores and overcomes their own role conflicts [13].

According to the theory of J. Moreno, the individual strives for constant self-expression. And in this he is helped not by rational work, but by human play in different roles and realities. Psychodramatist believed that the «role» refers to all manifestations of life and has not only socio-psychological but also general psychological nature [13]. In the course of playing life situations, conditions are created for the spontaneous expression of feelings and experiences related to the most important issues for the individual, which contributes to catharsis and insight. Catharsis and insight, on the one hand, promote self-expression, release of feelings, on the other - their clarification, awareness and integration, based on which a new understanding of their situation, new adaptive mechanisms and behaviors, changes in personality [13]. That is why spontaneity and creativity, which are the main components of psychodrama, allow individuals to actualize already known patterns of behavior, overcome their stereotypes and as a result develop new ways to respond in situations of interpersonal communication and overcome possible barriers.

Psychodrama is a method of group psychotherapy, which consists in acting out by members of a psychotherapeutic group scenes from their lives, in which, in particular, conflict or traumatic situations can be reproduced. This feature of the psychodramatic method is especially important in the overcoming barriers to interpersonal communication, because such reproduction creates the possibility of free reaction in safe conditions, which will promote the development of a variety of behavioral reactions in safe conditions.

The undoubted advantage of this method is also other members of the psychodramatic group, who are always participants in the dramatic process and consciously or unconsciously make their subjective contribution to the process of self-knowledge of the individual. Particularly effective in the context of the development of the effectiveness of interpersonal communication is the game basis of psychodrama, the predominant focus on action and the significant role of physical movements. After all, the situation of uncertainty is often accompanied by the inability to express in words the essence and features of the problem, and spontaneous movements in this case - will help relieve emotional tension and see a way out. Establishing a trusting atmosphere, intensive use of non-verbal communication opens the possibility of spontaneous self-expression in the group, which will promote self-confidence, willingness to use new ways to respond to life situations, which is so important in overcoming barriers to interpersonal communication.

Experimental part.

Prerequisite for a psychodramatic act is warm-up, action, sharing. Conducting online training requires the transformation of traditional ways of working and special skills of the trainer. Features of the stages of psychodrama adapted to the remote mode are presented below.

Warming up. The first and integral stage of psychodramatic action is warming up. There are a large number of methods and techniques of heating, below we will consider only some of them:

Locogram - participants tell where they are in the world now, where they would like to move, why, and what message (messages) from there they would send home.

Axiogram - a group is given a topic or opinion to discuss, participants express their views and take positions «for» or «against», then participants must take the opposite position to the one they chose, ie take a position «against» their own opinion and «for» the opposite opinion, and must defend and argue with this role.

Sociometry - to distribute and «build» group members according to height, eye color, date of birth, etc.

Re-waving - the group is asked a question and discussed, after the arguments of other participants, you can change your opinion and role.

Sociogram - the construction of the social atom (classical, collective, psychological, fantasy, etc., to build in terms of distance learning, you can use toys, objects or drawings).

Genosociogram - the genosociogram of each of the members of the psychodramatic group is built and discussed.

If the participant or participants can not say something, you can build a group sculpture, or choose a protagonist.

In the conditions of distance learning, the function of dividing the group members into individual halls is especially appropriate for the use of warm-up, where they will be able to reflect on their own psychological states and experiences in psychologically comfortable conditions.

Action. At this stage of the work, the first task for the coach is to create a special psychological space - a stage on which all subsequent staging of the protagonist will unfold. In remote mode, this is possible by turning off the sound and camera to all present, except the protagonist and the participants who play roles in the psychodramatic act. In addition, after entering roles, participants can change the caption of their real name to the role they play. Thus, an action will take place on the screen in which all the attention of the coach, participants and the protagonist will be focused on what is happening here and now with each role, without being distracted by other sounds and movements.

It is known that psychodrama is an active and physical form of therapy in which a special place is given to touch. Therefore, traditionally, group members are allowed to approach, touch or hug the protagonist as needed. Because this procedure is limited to the screen monitor, the protagonist and other members of the group can use additional means blankets, toys, scarves, etc. to create an atmosphere of presence of others, trust and satisfaction of the need for tact.

Sharing. At this stage of work, an effective and efficient way is to use the rule of the raised hand, which is implemented by attaching to your image a special icon - the palm (ZOOM) and signals the desire to speak. Thanks to this, the participants do not interrupt each other and do not create unnecessary noise, the priority in the desire to speak remains. It is also worth noting that at the time of discussion of psychodramatic action, participants may have spontaneous reflections, which they can write in the chat.

In accordance with the set goal and defined tasks, we conducted an empirical study of barriers to interpersonal communication between students in distance learning.

The study involved 37 first-year students majoring in «Psychology» in the age range from 16 to 18 years.

Data were collected both in person and remotely. In all cases, specially designed tools based on Google - documents (forms, tables, scripts) and HTML.

The obtained data were processed using the Excel spreadsheet application (MS Office 2016) and the SPSS statistical package (version 23). Excel (MS Office 2016) was used to visualize the results.

Analysis of available diagnostic methods that would meet the goals and objectives of our study, allowed us to choose different diagnostic resources. In the course of the research we used the following methods: 1) «S. Chen Internet addiction scale CIAS» (adapted by V. Malygin, K. Feklisova, 2011); 2) Method of diagnosing «obstacles» in establishing emotional contacts (V. Boyko); 3) «Scale of subjective experience of loneliness (SEL)».

Results and discussion.

Using the method «Chen Internet Addiction Scale, CIAS)», we determined the degree of Internet addiction, this method makes it possible to determine one of the following stages of Internet addiction: minimal risk of Internet addiction, the tendency to form an Internet addiction; formed and stable Internet dependence. The results of the study are presented in Fig. 1:

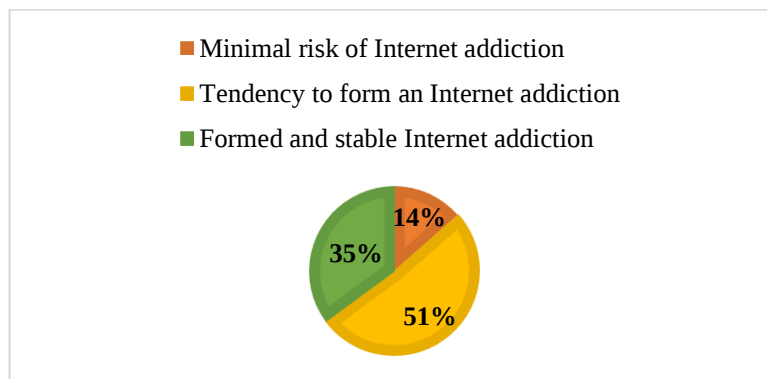


Fig. 1 - Degrees of the Internet - dependence on the method Chen Internet Addiction Scale, CIAS).

Analyzing Fig. 1, we can conclude that 14% of respondents have a minimal risk of Internet addiction, 35% have a tendency to form Internet addiction, and more than a third of respondents (35%) have formed and persistent Internet addiction. The obtained results can be explained by the introduction of quarantine restrictions and the introduction of distance learning, ie legalized almost round-the-clock stay of respondents on the Internet.

The next step was to study the severity of emotional barriers and their impact on interpersonal communication, the results of which are presented in Fig. 2:

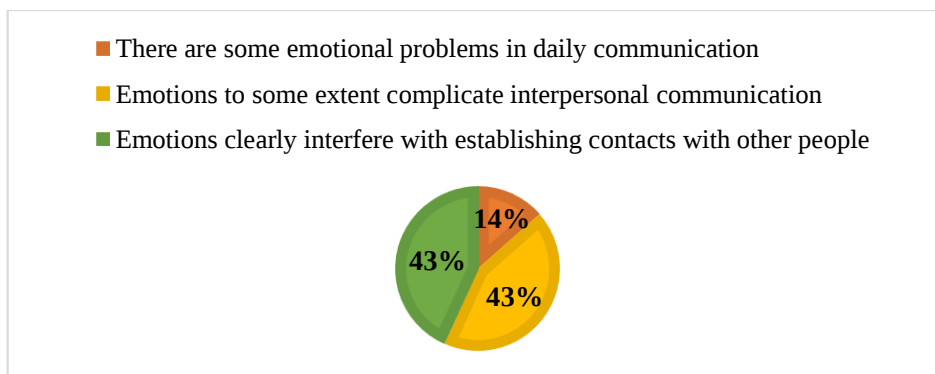


Fig. 2 - Expression of emotional barriers (V. Boyko).

We aimed to determine the level of expression and prevention of emotional barriers to daily communication. Fig. 2 shows that 14% of respondents have some emotional problems in daily communication, to some extent emotions complicate communication 43% of respondents, and clearly hinder the establishment of contacts with other people 43% of respondents.

To be able to analyze in detail the features of emotional barriers, we needed to determine the severity of the dominant emotional barrier at the group level (inability to manage emotions, inadequacy of emotions, inflexibility of emotions, dominance of negative emotions, reluctance to get closer to people). The results are shown in Fig. 3.

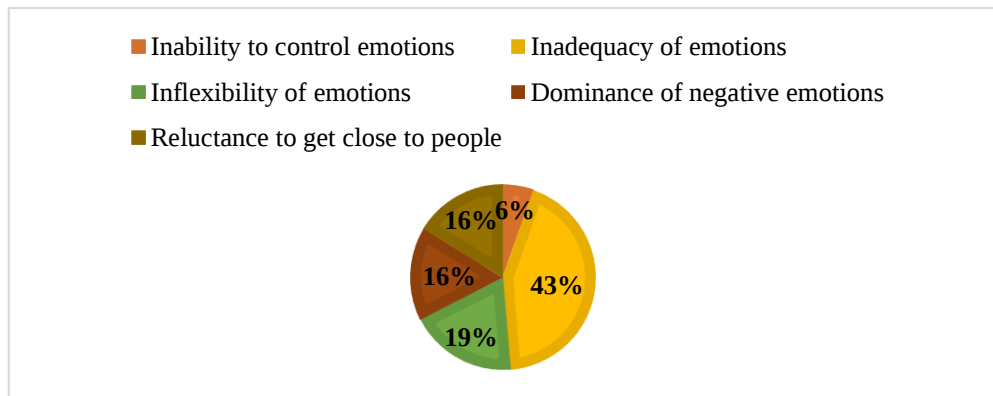


Fig. 3 - Dominant emotional barrier (V. Boyko).

Analyzing the results of Fig. 3, we can conclude that the predominant emotional barrier in the subjects was the barrier of inadequacy of emotions (was most pronounced in 43% of respondents), and the least pronounced - the barrier of inability to control their emotions (6% of respondents). The remaining barriers are present at a high level in a relatively equal sample size (19%, 16% and 16% respectively). The results can be explained by the fact that as a result of reducing the number of real student interactions, distance learning, communication via the Internet and negative psycho-emotional states that arise as a result, respondents have reduced levels of communication skills related to emotional communication and interaction.

And the last method we used was the «Scale of subjective experience of loneliness (SEL)», which aimed to identify the level of loneliness of respondents caused by difficulties in interpersonal communication, the results are presented in Fig. 4:

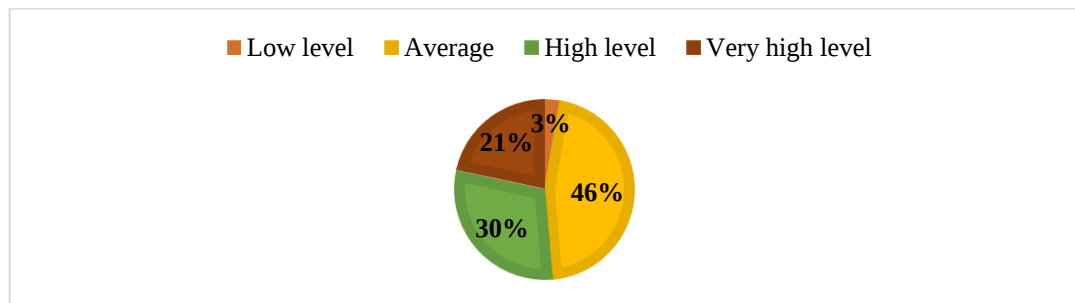


Fig. 4 - The level of experience of loneliness of respondents.

The data presented in Fig. 4 show that only 3% of respondents have a low level of subjective experience of loneliness, 46% of respondents experience loneliness at a medium level. It is worrying that 51% of respondents experience loneliness at a high level, with 21% of them experiencing a very high level. A very high level of loneliness indicates significant emotional discomfort. People with such assessments may have a complex of inferiority, they are most likely dissatisfied with themselves and their situation, deprived of trust in others and hope for the future. In our opinion, one of the reasons for such a high level of loneliness is distance learning, limited real live communication, and the phenomena caused by it - the presence of emotional barriers to communication and Internet addiction, with the peculiarities of virtual communication.

To confirm our assumptions, we performed a statistical analysis (Pearson correlation coefficient) of our data. The identified correlations are presented in Tab.1.

Tab. 1 - Correlation analysis of the obtained data.

	Indicator of Internet addiction	Scale of emotional problems	Scale of loneliness
Inability to control emotions	-0,325*	0,003	-0,347*
Reluctance to get close to people	0,389*	0,527**	0,454**
Scale of loneliness	0,162	0,583**	1
Scale of emotional problems	0,145	1	0,583**
Inflexibility of emotions	0,154	0,437**	0,564**

Analyzing the tabular data, we can say that there is a correlation between Internet addiction, emotional barriers to communication and loneliness.

This can be explained by the fact that on the one hand in the subjects may be afraid of close emotional relationships, with a fundamental need to satisfy them, which in turn can be realized through the Internet - communication. At the same time, on the other hand, the habit of communicating via the Internet can cause difficulties in real communication: growing anxiety about possible failures, the tendency to idealize a potential partner, ie to create problems of emotional intimacy. In addition, these problems may manifest themselves at the level of communication difficulties associated with inadequate interpretation of nonverbal communication signals, decreased empathy and communicative competence.

Taking into account the objectives of our study and taking into account the results of the observational experiment, we have developed training program to overcome emotional barriers to interpersonal communication in distance learning.

The overall goal of our socio-psychological training is to expand the opportunities for real interpersonal interaction and communication between participants and mastering their own life situation in the conditions of distance learning. According to the purpose of the training there are 4 stages of work.

At the first stage, we propose to focus efforts on understanding the current problem situation and what and how it prevents them. It is about understanding what barriers to communication, interpersonal interaction and its place in the life and work of modern man. At the second stage, work was carried out to acquire skills and abilities to establish and form interpersonal contacts in the conditions of distance learning. At the third stage, the main task is to reflect on the current situation of one's own life. In the fourth stage, based on the acquired ideas about the features of emotional barriers to communication, there is an increase in interpersonal interaction, awareness and development of skills and abilities to deal with their own experiences of risks and dangers, stress, destructive and constructive ways and strategies of distance learning.

The implementation of the main components of the above training units is carried out using the following psychodramatic techniques: monologue, dubbing, role exchange, self-presentation technique, mirror, side remarks, empty chair technique, step into the future technique.

Conclusions

The theoretical analysis of issue of barriers to interpersonal communication allows us to conclude that distance learning in a way affects the peculiarity of interpersonal communication. The correlation between Internet addiction and the difficulties of communication in adolescence is manifested in the fact that on the one hand, communication barriers, difficulties in understanding their own emotions and emotional states of communication generate interest in alternative virtual communication. On the other hand, virtual communication leads to a decrease in communicative practice in real communication, and thus - a decrease in communicative competence of young people.

Since the method of psychodrama is successfully used for personal self-knowledge and as a means of personal growth and development in various spheres of personal life, it will be especially effective in increasing the communicative competence of students. It will help increase resilience, overcome internal conflicts, develop spontaneity and flexibility in building interpersonal interactions. Work in a psychodramatic group can be based both on real, ie those that have already taken place, and on imaginary, those that can happen, situations; this feature of this psychotherapeutic method will allow to test, and as a consequence - to expand the set of behavioral strategies in the process of interpersonal communication. In psychodramatic action it is possible to dive into the past and travel into the future, modeling dreams and researching dreams.

The prospect of further research is a more detailed study and study of the impact of distance learning and virtual communication on the peculiarities of interpersonal interaction at different age stages, taking into account gender characteristics and testing of psychocorrective means to improve the effectiveness of interpersonal interaction online psychodrama.

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PROBLEMS OF ENVIRONMENTAL PROTECTION AND BALANCED NATURE MANAGEMENT. MODERN TECHNOLOGIES OF ENVIRONMENTAL PROTECTION.

UDC 628.46:628.43

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PROBLEMS OF DISINFECTION AND PROCESSING OF MEDICAL WASTE

The article provides an analysis of medical waste management in Ukraine. As medical waste is hazardous, it partially reflects the handling of dangerous waste components, such as chemicals used in medicine, heavy metals wastes, and other separately collected waste components.

Particular attention should be paid to medical waste because it can be not only a source of infectious but also toxic pollution. It can also contain very high concentrations of toxic compounds (cytostatics, antibiotics, and other drugs) and radioactive substances, which have a negative impact on human health and the environment. The amount of drugs and products of their metabolism that pollute the planet's water resources is increasing all over the world. That is why the problem of hazardous medical waste management in Ukraine needs to be solved.

We have carried out monitoring of medical waste, effective methods of disposal, and storage of waste within the dental medical center. The classification of pharmaceutical and medical wastes and ways of reducing the environmental impact of medical wastes are researched.

Biological waste, dressing material, polymer waste, metal, glass, chemical waste, mercury, X-ray film, paper, rubber, plaster casts, household waste were found among the medical waste of the dental clinic. The largest group of waste by weight in morphological composition are polymers (syringes, gloves, saliva ejector, etc.).

Hygienic and ecological assessment of waste disinfection methods is presented and relevant recommendations are provided. The higher efficiency of autoclaving in comparison with chemical disinfection of medical waste according to certain regulatory parameters is proved. Because the chemical disinfection does not guarantee the complete destruction of the infectious agent, it is recommended only as a temporary method of waste disinfecting with the following packaging and labeling for special disinfection.

Key words: *medical waste, dangerous waste, utilization, disinfection.*

Introduction. The accumulation of waste in authorized and unorganized landfills is one of the key environmental problems in Ukraine and the world. Many dangerous wastes are taken to landfills for solid household waste that seriously worsens the ecological situation. The category of hazardous waste includes medical, bioorganic, oil sludge, pharmaceutical, and others that can harm human health and the environment through improper storage, transportation, and processing. Particular attention should be paid to medical waste, which can be a source of infectious and toxic pollution.

As medical waste is hazardous, it partially reflects the handling of dangerous waste components, such as chemicals used in medicine, heavy metals wastes, and other separately collected waste components.

Most of the waste from medical institutions in Ukraine and the world is not hazardous and can be classified as solid waste. However, a large amount of this waste (about 10-16%) is a severe danger to patients, medical staff, as well as to the environment.

Medical waste cannot be classified as household waste, as its infectious risk can exceed 1000 and more times from harmless municipal solid household waste. They can also contain very high concentrations of toxic compounds (cytostatics, antibiotics, and other drugs) and radioactive substances, which have a negative impact on human health and the environment. Medical waste is for only 3-5% of total waste, but it is considered more hazardous.

The appearance of new scientific discoveries in the pharmaceutical field contributes to the creation of new technological processes that should increase productivity and improve the quality of finished products. However, hazardous medical waste management is an open question in Ukraine [1]. Only a small number of companies deal with the utilization of medical waste. Such waste should be disinfected and, as a possible option for utilization, incinerated, but not simply disposed of at all available landfills, which are intended for household waste. But it takes place that a very large part of medical waste is concentrated in these landfills.

Today, the pharmaceutical and medical industries are the important sectors of the world economy. The amount of drugs and products of their metabolism that pollute the planet's water resources is increasing all over the world. That is why the problem of hazardous medical waste management in Ukraine needs to be solved. Therefore, the issue of efficient, and safe collection, sorting, processing and utilization of medical waste remains actual for Ukraine and for the world community.

Purpose of the research: to track the dynamics of medical waste accumulation and identify perspective methods for their utilization.

The objectives of the research presented in the article are the analysis of medical waste management in Ukraine; dynamics of waste accumulation within one medical institution; hygienic and ecological assessment of waste disinfection methods.

Theoretical basis of the research. Currently, there are no common approaches to determining the qualitative and quantitative composition of medical organizations waste of different profiles at the present stage. Unfortunately, still there are no identical, scientifically defined hygienic and epidemiological approaches to the assessment and selection of the optimal method of hazardous waste disinfection. This may depend on the profile of the treatment and prevention measures, which determines the physicochemical, fractional properties of waste, and the organization of medical and geographical features. Moreover, there are differences in the classification of medical waste, both under Ukrainian law and by the classification adopted in the EU [1]. That is why the subject and purpose of the research are relevant.

Monitoring of hospital waste, determining effective methods of control and storage within each medical institution is important in effectively solving the problem of processing and disposal of medical waste. So, in experimental research, we tried to solve the following questions:

- determination of the number of unusable drugs and waste within the dental clinic;
- hygienic characteristics of waste management methods;
- effective logistics methods for waste disposal and removal [2].

Medical waste management in Ukraine is regulated by the «State sanitary and anti-epidemic rules and regulations on medical waste management» approved by the order of the Ministry of Health of June 8, 2015, № 325 (hereinafter – the Order) [3].

Unfortunately, health care facilities still use the Instruction on the collection, disinfection, storage, and delivery of used disposable plastic medical devices, approved by the order of the Ministry of Health of October 22, 1993, № 223. This instruction creates dangerous conditions both for medical workers and for an ecological situation. In particular, it contradicts the current Order in the part on disassembly of syringes and systems for intravenous infusion.

According to the current Order, medical waste is divided into the following categories:

- category A – epidemically safe medical waste;
- category B – epidemically hazardous medical waste;
- category C – toxicologically hazardous medical waste;
- category D – radiologically hazardous medical waste.

Category B is the largest group of hazardous medical wastes, which includes any wastes that have been in contact with biological fluids. For example, this category includes wastes that remain during and after the care of patients with COVID-19.

Chemical disinfection of category B wastes at the place of their generation is used as a mandatory temporary measure in the absence of a centralized disinfection system. Liquid waste of category B is poured into the centralized sewage system only after preliminary decontamination by chemical or physical methods. Thermal

disposal of category B waste is carried out by a centralized method, in the absence of special equipment in the institution. All wastes of categories B and C are collected in labeled containers with tight-fitting lids and stored in specially designated areas.

Collection, temporary storage of waste cytostatics and genotoxic drugs (class B), as well as all types of waste generated by the preparation of their solutions (vials, ampules, etc.), without decontamination is not allowed. Medical waste must be immediately decontaminated at the site of their generation using appropriate methods. It is also necessary to carry out complete decontamination of the workplace. All processes with such waste must be carried out with the use of appropriate personal protective equipment and always in a fume hood.

Category B medical waste must be transferred to specialized companies which are licensed to carry out operations of hazardous waste management.

Experimental part. Methods and equipment permitted for use in Ukraine in accordance with the procedure established by law should be applied for waste disinfection [3]. If disinfection is carried out on the objects of their formation, then both chemical and thermal disinfection is used. The most common are the following types:

- «Classical» chemical disinfection includes the treatment of waste with registered disinfectants, in the way prescribed by the Ministry of Health, and recommended for use as chemicals of disinfecting for medical waste class B in concentrations and exposure times specified for viral infections and/or mycobacteria of tuberculosis (for example, ammonium salts and organochlorine preparations).

- Sorption chemical disinfection involves the collection and disinfection of liquid (organic) waste of classes B and C. For this purpose, special packages of the complete isolation system and absorption of polymeric material (SAP-polymer) are used for this type of waste. Such systems convert liquid into a gel with simultaneous complete disinfection. Packages «Oops-bag» contain an external moisture-proof shell and an internal bag with the adsorbent (SAP-polymer).

- Ozone-oxygen disinfection is carried out in special apparatus. The disinfector is intended for low-temperature disinfection with ozone contained in the ozone-oxygen mixture of objects with the medical waste of class B, including directly in the places of their primary formation. Disinfection is carried out in the ozone-oxygen environment that fills the sterilization camera, due to the influence of ozone, which has an extremely high oxidizing ability.

- Chemical disinfection with simultaneous grinding. Technologically, this method includes the operation of a mechanized apparatus that uses chemicals as a disinfectant, followed by mechanical grinding in a closed camera. It should be noted that the equipment of «Sterimed-1» allows more complete penetration of the disinfectant into the thickness of disinfected medical waste. Thus, there is an increase in the efficiency of chemical disinfection, and as a result, the amount of disinfectant consumed significantly reduces, as well as recycled hospital waste.

- The action on the waste by steam under pressure is carried out in special autoclaves. Autoclaving is one of the methods that has long been used as a decontamination technology, and all over the world. This method is approved for use in many European countries and is regulated by the WHO Directive as a method of thermal disinfection of medical waste of classes B and C.

- Temperature disinfection with simultaneous grinding (Newster method). The principle of action of the installation is based on the previous fine shredding of waste by frictional heating supplemented by resistance heaters of waste up to about 155°C. The increased temperature occurs due to the force of friction in the process of fine grinding. Dry powder waste is generated as a result of the disposal, it reduces in volume by more than 7 times, completely safe in ecological, hygienic terms.

- Microwave disinfection. The disinfection system is represented by an instrument of passive way of action, which does not require direct contact with the patient, does not have any effect on him. The disinfection system complies with the requirements for the treatment of class C waste in terms of resistance to mechanical factors. This system is equipped with a personal operating device, such as a computer, which can print a check with the parameters specified in the cycle of medical waste disinfection. This equipment also includes a press.

The chemical method is not recommended for use, including the Order of the Ministry of Health.

It is dangerous for medical workers, expensive, has low disinfection efficiency. However, it is used by most health care facilities in Ukraine. Steam treatment at high temperatures under pressure (autoclaving) is the second method most used by health care facilities.

Results and discussion. The object of the experimental study was a private dental clinic located in Vinnytsia. The average annual number of patient visits is 4,000, the number of staff is 16 people. The number of employees serving 1 shift (daily) is as follows:

- doctors (including surgeons, pediatric dentists) – 5;
- technicians – 2;
- nurses, medical assistants – 6;

- administrator – 1;
- junior medical staff – 2.

The waste storage and disinfection room has an area of 14 m², has a window, and is equipped with ventilation of household capacity. In accordance with the requirements of the Ministry of Health [3], the cabinets are provided with a cold and hot water supply, drainage, autonomous ventilation system.

Planning and design solutions of cabinets and offices provide the flow of the technological process and the ability to comply with the principle of division into «clean» and «dirty» zones. The room has shelves for storage and packaging of each type of hazardous waste. During the movement of materials and waste, the principle of «one-way road» is observed, which provides the logic of material flows, while «clean» and «dirty» material flows do not intersect. Movement of the infected and hazardous waste is planned through the incubation corridor.

Types and morphological composition of waste were studied by analysis of waste structural units of a multidisciplinary dental clinic. This analysis is shown in table 1.

Table 1 – Sources of formation and morphological composition of waste

Structural unit	Type of waste and their morphological composition
Dental therapeutic department	Dressing material, polymer waste (syringes, gloves, saliva ejector, etc.), metal, glass, chemical waste, mercury, X-ray film, paper, rubber, plaster casts, household waste
Pediatric dental therapeutic department	Dressing material, polymer waste (syringes, gloves, saliva ejector, etc.), metal, glass, chemical waste, mercury, X-ray film, paper, rubber, plaster casts, household waste
Dental surgical department	Biological waste (teeth), dressing material, polymer waste (syringes, gloves, saliva ejector, etc.), metal, glass, chemical waste, mercury, X-ray film, paper, rubber, plaster casts, household waste
Dental orthodontic department	Dressing material, polymer waste (syringes, gloves, saliva ejector, etc.), metal, glass, chemical waste, mercury, X-ray film, paper, rubber, plaster casts, household waste
X-ray room	Metals, glass, X-ray film, paper, rubber, household waste, polymer waste

The general structure of all types of waste generated daily in the studied dental clinic is presented in Fig.1.



Figure 1 - The average composition solid waste of the clinic:
 1 – safe waste (A); 2 – potentially infected waste (B);
 3 – toxicologically hazardous medical waste (C); 4 – other wastes.

Other wastes include wastes that are transferred in batches for special disposal without damaging the packaging. falsification and overdue drugs belong to this group first of all.

The largest group of waste by weight in morphological composition are polymers. Figure 2 shows the fractional composition of polymer waste in a dental clinic.

Thus, in the studied dental institution, the amount of PVC (polyvinyl chloride) in the composition of polymeric medical waste is from 4,06% to 8,50%. The largest amount of polymer waste is generated during therapeutic appointments.

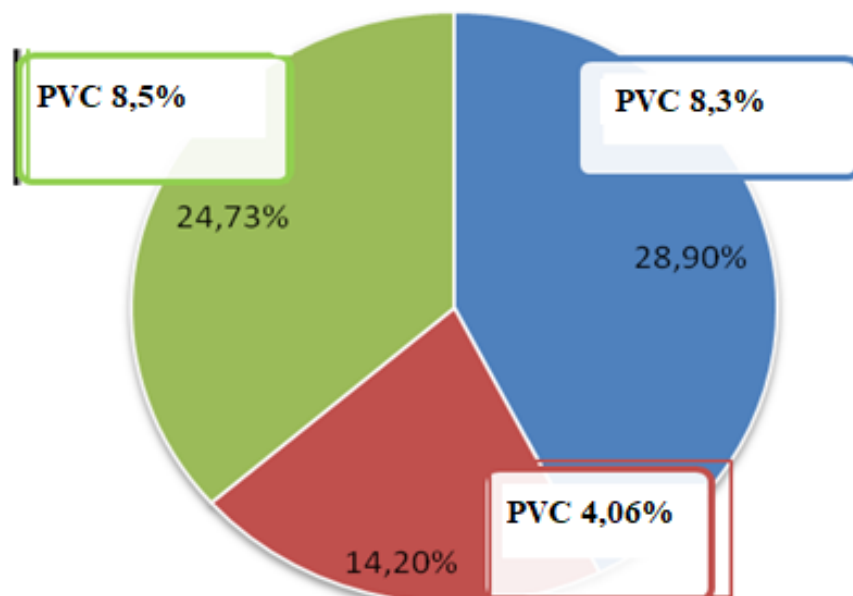


Figure 2 – Fractional composition of polymer waste:
■ - treatment cabinets 1-3; ■ - surgical cabinet; ■ - X-ray cabinet.

Disinfection of waste in this institution is carried out by the method of classical chemical disinfection and by treatment of waste with hot steam (autoclaving method). Chemical disinfection is carried out with drugs based on chloramines. In this way, not only wastes are disinfected but also medical cabinets, premises for procedures, and workplaces of staff. Comparative characteristics of the two methods of disinfection are shown in table 2.

Table 2 – Evaluation of disinfection methods

Evaluation criteria	Classical chemical disinfection	Steam treatment under pressure
Complete destruction of infections	No (-)	Yes (+)
Decrease of waste volume	No (-)	Yes (+)
Use of chemical reagents	Yes (-)	No (-)
Grinding	No (-)	No (-)
Presence of harmful emissions	Yes (-)	No (+)
Changing the appearance of waste	No (-)	Yes (+)
Need for additional sorting	No (+)	No (+)
Presence of filters	No (-)	No (-)
Productivity (kg / h)	1-5 (-)	8÷12 (+)
The sum of positive points	1	6

Thus, the higher efficiency of autoclaving in comparison with chemical disinfection of medical waste according to certain regulatory parameters is proved.

Because the chemical disinfection does not guarantee the complete destruction of the infectious agent, it is recommended only as a temporary method of waste disinfecting with the following packaging and labeling for special disinfection.

Timekeeping of disinfecting waste procedures has been performed for medical employees. Comparative characteristics for the two methods of waste decontamination are shown in table 3.

Therefore, the method of waste treatment by steam under pressure is recommended as a full-fledged disinfection method

Table 3 - Timekeeping of procedures for medical employees for different methods of waste disinfection, min.

Type of processing	Therapeutic and diagnostic processes	Preparation of chemical solutions	Preparatory activities	Waste processing	Tool processing	Working with documents	Total time
Chemical disinfection	16	32	25	125	40	25	263
Autoclaving	20	-	20	45	20	25	130

Thus, the staff spends twice as much time treating solid waste by chemical disinfection than when treating waste with steam under pressure. Summary of the advantages and disadvantages of each method, based on observations, are presented in table 4.

Table 4 - Advantages and disadvantages of waste decontamination methods used in the dental medical center

Type of disinfection	Advantages	Disadvantages
Chemical disinfection	High efficiency of disinfection at professional and long treatment. Low cost of disinfectants and equipment. The method is easy to realize.	Highly qualified service is required. Toxic substances are used that require special safety principles. Not used for toxic waste, drugs, and some infected waste.
Recommendations: Only as a temporary method of disinfection, private practice clinics.		
Autoclaving	Ecologically safe method. Significant reduction of waste. Relatively low capital and maintenance costs.	Highly qualified service is required. Not used for biological, pharmaceutical, and toxic wastes, for wastes impermeable to vapor.
Recommendations: ambulatory clinics, dental institutions, medical assistant and obstetric units.		

Conclusions

Monitoring of medical waste, effective methods of disposal and storage of waste within the dental medical center were carried out. The analysis of quantitative characteristics and fractional composition of wastes of classes B and C testifies to their polymorphism and depends on the type, the volume of medical care, and logistical support of medical institutions. The monitoring of hazardous waste on the structural departments of the dental clinic indicates that 48% of all waste of classes B and C is generated in the surgical department.

The staff spends twice as much time treating solid waste by chemical disinfection than when treating waste with steam under pressure. The chemical disinfection does not guarantee the complete destruction of the infectious agent, that's why it may be recommended only as a temporary method of waste disinfecting with the following packaging and labeling for special disinfection.

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WASTE MANAGEMENT IN SWITZERLAND AND REMARKS TO OTHER COUNTRIES

Abstract

To understand the different situations in all countries it is necessary to compare the different mentality, financial situation, culture, politic, law and other influencing factors. Therefore, it is not possible to transfer one system from one country to another without special control of all possible situations. In most of the countries, cheap landfilling is popular. In Switzerland, since about 40 years ago landfilling of household waste was not allowed. The small county with 8.5 mi. inhabitants operate 25 incinerator plants for household- and hospital waste. There is also a recycling system in Switzerland, but recycling is too expensive. For this aspect, for most products a small part for the waste management is included in the selling price. The recycler gets this money paid by the waste foundation.

Introduction

In order to understand waste management situation in the world and the big difference between the countries, it is necessary to clarify the influencing factors such as mentality, culture, financial possibilities, politic situation, legal rights, market, acceptance by the people, and other. Therefore, it is not possible to transfer the system, which function in perfect way in one country, to another country. This is also valid for the waste management. For example, if waste pre-sorting is practiced in one country, it can fail in another country because the requirements are different. In many countries, waste is put away somewhere like a bad ghost, which we need to go away. Landfill is the most common method to eliminate a waste. It is cheap, without big technical installations, only collection, transportation and deposition. But the environmental consequences, especially impact on groundwater, are usually not discussed. The average household waste generation in Europe is about 280 to 350 kg per person [1,2] and the heat value is about 1000 to 1200 kJ/kg [3]. Thus, waste is a valuable material and could be used.

Discussion

In Switzerland, the first incineration plant for household waste started to operate in Zurich in 1974 and produced electric power and hot water for heating. In the same time, a new law abandoned landfills. In the small Switzerland with 8.5 Mio habitants, 25 waste incineration plants operate and produce about 18% of required energy [4,5]. The off gases from incinerators are cleaned by a filter and 3 steps of washing with chemicals are used to fulfill the requirements.

There is also a standard organic waste separation in the kitchen. People usually have two boxes for organic waste and other waste (for incineration), which are integrated in the furniture (Fig. 1).

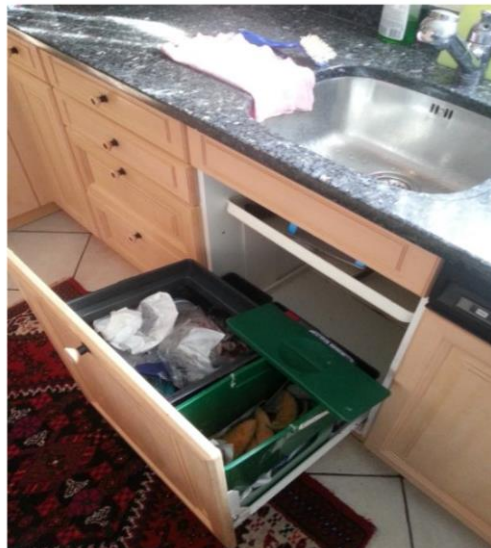


Figure 1. Standard kitchen with two boxes for household waste

The biological waste is then putted in controlled green container in front of every house (Fig. 2). The other (mixed) waste is collected in special black plastic bags with labels which people have to buy. Thus, two waste collection cars are necessary. It is possible to produce gas from biological waste under an anaerobic process. Also, one can compost biological waste – the product is composted earth and can be sold in garden centers for flowers.



Figure 2. The place for waste containers

If two different containers are located without control, the presorting will not function.

Nowadays, everyone in Europe is speaking about recycling. Recycling follows the standards of general management. Therefore, first point is to clarify: a) who will buy sorted material, b) what type of material (specification) does buyer need, and c) what is paid for this material. Below is an example of plastics. There are lot of different types of plastics. Do you have only PET? Which molecular type of PET? Color, caps, paper labels, not-washable glue of the labels and many other questions have to be clarified first. Then, one should check the existing input: mixed household waste or separately collected material. Then, you need to discuss the necessary preliminary work – separation, cleaning, press balls, etc.

Also, in Switzerland we have a special waste collecting system. We have a special law which implies recycling. If a shop sell something, then they have to take back the old product. Some money for the waste management is included in the selling price. For example, the selling price of refrigerator includes the costs for dismantling of an old one. The price for PET bottles also includes small amount for the recycling. At the entrance of the shopping centers, there are special installations for controlled return of PET bottles, glass bottles, batteries and other materials without payment (Fig. 3).

People's motivation to give back PET and glass bottles is the reduction of waste in black bags, for which they have to buy expensive labels.



Figure 3. Special installations in shopping centers

Other materials can also be returned to controlled waste collecting centers. Typical recycling materials are:

- newspapers and packaging paper (to produce carton and boxes);
- materials from buildings demolition (for street construction);
- glass (to produce isolation wool);
- batteries (for metal recycling);
- PET bottles (to produce parts for cars and other plastic parts);
- mixed plastic (for alternative fuel);
- tires (for alternative fuel, especially in cement plants);
- wood (to produce pellets for heating);
- biological material (for anaerobe process to produce gas).

In Switzerland, recycling is mostly an expensive idea. There is the pre-payment system (you pay for waste handling in the moment of buying). This additional amount of money is paid to special foundation. If some company show the correct recycling possibility and the product is of good quality, they get the necessary amount of money for the appropriate installations from this foundation. Export of waste is only possible if there is no possibility to process the waste in Switzerland.

Conclusion

Let us have a look to the future. Until recently, waste was never discussed. There was also no possibility to get know-how in this field. Today, most people know that waste is the “brother” of production and every product will once become waste. A lot of knowledge is necessary to handle waste in the right way. But much more commitments and efforts are necessary. Waste management needs know-how in standard management, chemistry, physics, mechanics, etc. If waste management is an accepted faculty, significant recourses saving is possible. But it is also necessary to change the mentality in some countries. For this change, the motivation (by education, money benefit or legislation) is needed. In waste management, too much regulations can eliminate the interest and efforts in this field. Not everything what is possible is reasonable.

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ECONOMIC CALCULATIONS OF THE CHOICE OF PESTICIDE DISPOSAL METHOD

Goal: is a brief analysis of the main ways of dealing with unusable pesticides and pesticide-containing wastes and facilities and substantiation of technical and economic parameters of processes of neutralization of unusable pesticides and hazardous waste, as well as establishment of the most optimal methods and ways of their utilization.

To establish the most optimal methods and ways of utilization of pesticides and pesticide-containing waste, a financial and economic assessment of pesticide exports from Ukraine to processing plants in Europe was made, the cost of burning pesticides at specialized plants in Ukraine was calculated, the total cost of reclamation works was calculated. on recycling of pesticide containers.

Methodology: To solve the tasks in the work used modern methods of scientific research: analysis - to summarize modern scientific and technical advances in the prevention of environmental pollution due to pesticides entering the environment; indication methods - for assessment of soil, water and air pollution; methods of reclamation of contaminated areas and incineration of pesticides; methods of analysis of gas mixtures, etc.

Scientific novelty: for the first time scientific and methodological calculations of environmental safety parameters and management of unusable pesticides and pesticide-containing wastes, the essence of which is to take into account the main components of the cost of pesticide disposal and restoration of contaminated areas, including management actions for all components of pesticide territories and largely solve the problem of pesticide pollution.

Conclusions: calculations of the cost of recycling various facilities that contain unusable pesticide-containing drugs and waste and established the most optimal methods and ways of recycling pesticides in Ukraine. A brief analysis of the main methods of handling unusable pesticides and pesticide-containing waste and facilities and substantiated the technical and economic parameters of the disposal of unusable pesticides and hazardous waste, as well as the most optimal methods and methods of their disposal.

Keywords: pesticides, pesticide-containing waste, utilization, processing methods, cost.

Introduction

At the present stage of development of agricultural production in Ukraine is an extremely acute problem of circulation, export, disposal and processing of residues unusable and prohibited for use chemically hazardous substances and, above all, pesticides and pesticide-containing waste, which include, in particular, used packaging, obsolete structures, chemical warehouses and storage facilities, degraded and contaminated PP above normal soils adjacent to them, etc. At the same time, the implementation of appropriate disposal works requires a lot of effort, the use of the latest technologies for processing and transshipment operations, the need to use significant financial and economic resources, strict compliance with safety rules and sanitary-epidemiological indicators and more. Recently, some state resources have been used to finance neutralization and utilization works, as well as the export of a small part of PP and PVV for processing outside Ukraine, but these amounts of budget funding were and are extremely scarce and insufficient to completely eliminate this problem. To this should be added the almost complete absence in the state of the necessary production capacity for such processing and disposal of accumulated PP and PVV, special transport, trained personnel and so on. In addition, there is no single centralized system of accounting and integrated management of pesticide residues and other agrochemicals, as well as their inventory, proper control over compliance with the requirements in the field of hazardous waste management by both the state and businesses,

The purpose of this work is a brief analysis of the main methods of handling unsuitable pesticides and pesticide-containing waste and facilities and substantiation of technical and economic parameters of disposal of

unusable pesticides and hazardous waste, as well as establishing the most optimal methods and methods of their disposal.

Theoretical foundations of the study

There is a scientific, technical and managerial problem of danger and associated risks of storage, processing, transportation, disposal, including: containers of pesticides and pesticide-containing waste, as well as the liquidation of warehouses and storage of HZZR, reclamation and remediation of land around them and others. To solve any applied environmental problem requires the efficient use of available resources (including financial) and a detailed strategy for managing this issue. To understand the optimal environmental and economic solution to the problem of pesticides, it is necessary to calculate the economic parameters of disposal and treatment. For this purpose it is necessary to consider the financial and economic estimation of export of pesticides abroad for processing, to consider a possibility of burning at processing plants of Ukraine,

Undoubtedly, from the beginning of production and use of HZZR for a long time this problem was addressed by domestic and foreign scientists and practitioners [4], in particular: Melnikov MM, Ransky AP, Petruk VG, Patika VP, Krainov IP, Lisichenko GV, Ivanyuta SP, Glukhovskiy IV, Kachinsky AB, Zabulonov YL, Furdychko OI, Moklyachuk LI, Zerkalov D.V. and many other scientists. However, their well-known scientific works are largely dominated by the solution of specific, local problems, rather than solving the problem as a whole [5-6].

Therefore, the scientific substantiation of economic calculations for the disposal of unusable pesticide drugs (expired, mixed, substandard, unidentified, etc.), other chemical plant protection products and hazardous waste is an extremely important issue for science and practice and the environmental sector of Ukraine.

Results and discussion

1. Financial and economic evaluation of the export of pesticides to processing plants in Europe

Table 1 - Calculation of the cost of export from Vinnytsia region

Expense items	Storage location	Quantity, tone	Cost, dollars per ton	Costs, USD	Expenses, UAH
Export of pesticides	Dzhurinsky poison burial ground	2100	3 thousand	6.3 million	163 million
	warehouses of Vinnytsia region	849, 239	3 thousand	2.5 million	65 million
TOTAL				8.8 million	228 million

The table includes the cost of exporting 1 ton of pesticides with all costs within \$ 3,000. US per ton. This average value was calculated based on the statistics of pesticide exports from Ukraine in 2012. Obviously, this cost is somewhat inflated, but in the conditions of non-corrupt exports, this amount may be much lower.

Today in Ukraine there is a resolution of the Cabinet of Ministers №1212 "On Amendments to Clause 11 of the Regulations on Control over Transboundary Movements of Hazardous Wastes and Their Utilization / Disposal", which simplifies the transboundary movement of unusable pesticides. Also, this resolution makes it possible to solve the problem of unusable pesticides directly, without the permission of the Ministry.

Table 2 - Calculation of the cost of export of pesticides from Ukraine

Expense items	Storage location	Quantity, tone	Value, dollars per ton	Costs, USD	Expenses, UAH
Export of pesticides	Warehouses of regions of Ukraine	18 thousand	3 thousand	54 million	1404 million

For the state budget, this amount is quite significant and in the current economic situation of the state is unlikely to allocate funds for such a project. However, for regional funds, gradual export is more appropriate, taking into account the fact that the region has an average of 720 tons of pesticides, which will cost for export an average of 56 million UAH.

The total number of unusable pesticides within Ukraine is 18,000 tons. Accurate data are currently not available even in the relevant Ministry of Ecology, as inaccurate accounting is conducted. For example, the Dzhuryn Poison Cemetery estimates that 2,100 tons of pesticides have been stored, but no one has ever repackaged or weighed them, and the estimate has been roughly based on the volume and quantity of pesticides. Therefore, the exact data on the volume of accumulated pesticides are unknown.

2. Incineration of pesticides at specialized plants of Ukraine

The cost of the specialized Sava plant in Brunsbüttel, where pesticides are burned according to European standards, is about 70 million euros, which is about 1935 million hryvnias. At a specialized plant, pesticides are

burned, and the formed gases undergo multi-stage purification. The cost of treatment equipment alone is about 50 million euros.

There is currently one mini-plant for burning pesticides and containers in Ukraine without standard treatment equipment and without the appropriate licenses. It is also planned to build infrastructure for the disposal of ozone-depleting compounds and persistent organic pollutants in accordance with the projects UNIDO (United Nations Industrial Development Organization) in Cherkasy.

In fact, today in Ukraine there is no possibility to recycle pesticides and containers in accordance with environmental regulations.

Table 3 - Incineration at a specialized plant Ukraine (estimated cost, taking into account world tariffs)

Expense items	Storage location	Quantity, tone	Value, dollar per ton	Costs, USD	Expenses, UAH
Repackaging	Warehouses of regions of Ukraine	18 thousand	200	3.6 million	97.2 million
Transportation	Warehouses of regions of Ukraine	18 thousand	100	1.8 million	48.6 million
Total					UAH 145.8 million

From this table it becomes obvious that the procedure of processing and transportation costs about one tenth of the cost of the incineration plant. That is, the main cost item is the construction of a plant, which after processing pesticides can be used further, with a focus on other types of waste and raw materials. Such raw materials can be:

1. Insignificant volumes of unusable pesticides that will be formed in the future as a result of exceeding the shelf life of pesticides. Currently, in our country, such pesticides are sold and used in violation of the law. Expired pesticides can now be found in almost any pesticide warehouse.
2. Incineration of highly toxic organic industrial waste.
3. Incineration of illiquid plastic and non-recyclable recyclables.
4. Burning of rubber products and tires.

3. Mobile plasma thermal complex for processing unusable and unidentified pesticides and other pesticides

Currently, there are many examples of successful industrial implementation of the method of plasma thermal processing of a large list of toxic wastes that are recycled by mobile plants in different countries, in particular:

- EA TECHNOLOGY (England): ethanediol, trichloromethane, benzene-alcohol, dichlorobenzene, waste oil distillation, polychlorinated biphenyls (PCBs);
- Alberta Center (Canada): 1 - acetone, gasoline, methyl ethyl ketones, special solvents; 2 - chloroform, dichloromethane, carbon tetrachloride and PCBs;
- PLASCON (Liverton, Australia): toluene and chlorophenol with toxic additives and 2,4-D-butyl ether;
- SOLVAY (Germany): chlorofluorocarbons;
- EST Ltd. (Beersheba, Israel): methylene chloride, polychlorinated carbons and hydrocarbons (C - 60%, C1 - 30%);
- Institute of Heat and Mass Transfer of the National Academy of Sciences of Belarus (Minsk, Belarus) and TVS Merseburg (Germany): methylene chloride, trichlorethylene (C₂H₃Cl₃), alcohol-benzene mixtures (with rosin additives);
- Integrated Environmental Technologies, LLC (PEM - Plasma Enhanced Melter): PCBs, plastics, medical and biological waste;
- WESTINGHOUSE (USA): processing of CCl₄ in a mixture with methyl ethyl ketone, ethanol and water, diphenyl chloride, the degree of decomposition of biphenyls - 99.99%. 160 Dangerous toxic substances (dioxins, dibenzofurans) in gases were not observed;
- PLASMOX (Switzerland, Germany): processing of combat poisons.

The mobile plasma complex, further [7] is intended for utilization (processing) of unsuitable and unrecognizable pesticides and other pesticides located in various places, including on old field warehouses, in the destroyed rooms and other places from where their transportation is dangerous to health. people. The planned productivity of the complex is over 1000 t / year.

The estimated cost of such a complex is about \$ 8 million. But the disadvantage of such a complex is the significant energy costs during the disposal of pesticides, which makes the disposal process extremely expensive.

4. Reclamation of areas contaminated with pesticides

There are many areas and lands contaminated with pesticides. Contaminated areas include those where permissible concentrations exceed the standards [8]. Such lands are usually:

- territories of destroyed warehouses and storages of pesticides and adjacent territories within a radius of 50 m;
- agricultural soils, in excess of the MPC;
- territories of industrial enterprises where POPs are stored;

To this list can also be added a number of industrial facilities where some industrial waste is stored.

Among the methods of reclamation of pesticide contaminants are:

- Excavation followed by immobilization or bioremediation;
- Water pumping and treatment of contaminated solutions;
- Soil steam extraction;
- Injection (supply of sprayed air or oxygen) to accelerate the biodegradation of PP;
- Heating of the contaminated area by electric current or radio frequency field (thermal methods);
- Electrokinetic methods (electroosmosis, electrophoresis, electrolysis);
- Bioremediation;
- Plowing;
- Composting and biocup;
- Phytomelioration.

Given the peculiarities of pesticides [9] and their properties for spontaneous decomposition into simpler compounds, some areas of warehouses over time have already cleared themselves of excessive concentrations of pesticides. However, in warehouses where pesticides with a long half-life were stored, there are still exceedances of the MPC. It is obvious that for an accurate answer to this question it is necessary to provide a qualitative analysis of soils in the territory and near the warehouses of pesticides.

Soils with a significant excess of the MPC (over 10) should be disposed of in the same way as pesticides, as biological methods for such contamination will not be effective enough. In addition, biological reclamation is long-lasting, and the reduction to the standard values of the MPC can occur for many years, during which pesticides will adversely affect soils, groundwater and surface water and human health.

As the experience of previous years shows, high-quality reclamation of soil contamination with pesticides in the Ukrainian reality is possible only with the use of biological reclamation and remediation due to their low cost. Therefore, it is necessary to calculate the cost of work on effective biological reclamation of areas contaminated with pesticides within 1-9 MPC.

Table 4 - Estimation of the cost of works for the area of warehouses 1 ha as of 2021

cost item	Cost, UAH	
	On 1 hectare	Total
losses from the temporary seizure of land	0	0
costs of mining reclamation, UAH	-	70200
including costs for planning and logistics of works, UAH	13000	13000
including the cost of removing the top layer, transportation, UAH	26000	26000
including the cost of dismantling structures, their removal, UAH	31200	31200
costs of biological reclamation, UAH	39400	39400
The total cost of works for the warehouse area		179800

When calculating the total cost of reclamation works of warehouse plots for Ukraine with a total area of about 6,000 hectares, we will receive a maximum amount of UAH 657 million. For the state, this amount is insignificant and can be allocated to achieve environmental security of the country, and for some of the warehouses certain types of work no longer need to be performed. For example, dismantling of structures or removal of the top layer of soil, and it is necessary to carry out only biological reclamation.

5. Disposal of pesticide containers

Container disposal in Ukraine is currently carried out by Eco Nova and others as intermediaries. Tariffs for this type of processing range from 6 UAH / kg to zero. And there are entrepreneurs who are ready to take free plastic containers from pesticides. Prepared means thoroughly (three times) washed and pressed [10]. Although for small agricultural enterprises with small volumes of pesticide use, the preparation of containers is not economically viable, as it requires the press and skilled workers. In addition to plastic packaging, there are other types of packaging that are impossible to recycle (or impractical), and the only technology treatment (disposal) is high temperature combustion.

The volumes of container formation according to experimental calculations range from 20-50 grams per kilogram (liter) of pesticide, both in retail and wholesale. But in a small container, the total weight of the package is greater.

Table 5 - Calculation of the cost of recycling containers of different volumes.

Volume, l	Libra, gr	Package weight per 1 l, g	The cost of disposal at a rate of 6 UAH / kg (average value)
0.25	24-27	96-108	0.612
0.33	21-24	63-72	0.405
0.5	24-28	48-56	0.312 th most common
1	33-36	33-36	0.207
1.5	36-42	24-28	0.156 th most common
2	42-45	21-22.5	0.132
5	91	18.2	0.109
10	157-540	15.7-54	0.024
20	768	38.4	0.023

The most popular in agricultural enterprises is a container of 10-20 liters, due to its convenience and at the same time large areas that can be processed with this volume. There are pesticides in plastic barrels of 200 liters, but as a rule, such barrels are not recycled and reused or for other purposes after steaming. The same applies to steel containers.

Conclusions

Thus, the cost of disposal of various facilities that contain unusable pesticide-containing drugs and waste was calculated and the most optimal methods and methods of pesticide disposal in Ukraine were established. However, the feasibility of using a particular method of waste disposal should be determined only taking into account the implementation of sanitary and hygienic standards and economic indicators.

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STUDY OF ECOLOGICAL TECHNOLOGY OF LEATHER TANNING WITH THE USE OF MODIFIED MONTMORILLONITE

The article is devoted to the analysis of the level of environmental friendliness of the chromium tanning process carried out with the use of modified montmorillonite.

Leather technology has a complex technological sequence of processes and operations for the processing biogenic material. The leather technology is based on a set of various, consistently performed processing of leather raw materials and semi-finished products. The technology uses chemical materials that are not always environmentally friendly. The principles of greening provide for complete or partial exclusion of environmentally unfriendly materials from technological processes. The eco-destructive impact on the environment of chromium tanning was established. Therefore an innovative direction of eco-friendly leather production is the partial replacement of tanning compounds of chromium with other structuring compounds that have a structuring effect.

The aim of the work was to determine the ecological efficiency of the technology of manufacturing leather obtained using modified montmorillonite. The object of research is the process of formation of leather properties in the process of tanning with the use of modified montmorillonite.

Environmental friendliness of chromium tanning technology with the use of modified montmorillonite is substantiated by: efficiency of formation of dermis structure; increasing the level of leather quality indicators; partial replacement of chromium compounds during tanning.

The technology provides: reduction of the negative impact on the environment of leather production; reducing the amount of chromium compounds in the tanning process; reduction of production costs for purification of waste liquids; increasing indicators of biological and chemical oxygen consumption; obtaining after tanning potentially biodegradable wastewater.

Key words: ecological compatibility, natural leather, chrome tanning, modified montmorillonite, environment, quality.

Introduction.

Natural leather is a versatile material. The range of leathers includes leather for shoes, garment leather, leather for haberdashery, etc. The leather must have high vapor permeability, strength, ability of a material to endure alternate wet and dry conditions for a long period without considerable deformation and loss of mechanical strength.

The production of natural leather is a multi-stage technology of the biogenic origin material treatment. The technology involves the sequential conduct of chemical processes and mechanical operations. The chemical materials used in the technology contribute to the production of high leather quality. In this case, the materials can have a negative impact on the environment. In the leather production, the environment is affected by: by-products; waste; emissions into the atmosphere, soil, water, etc. Production is accompanied by the formation of industrial wastewater, noise, vibration, various types of radiation and more.

Leather production in the amount of waste is one of the first places among industrial enterprises. Leather by-products and wastes account for up to 50% by weight of raw materials [9]. In addition, the tannery uses 10-30 m³ of water to process 1 ton of raw materials. Thus, there are a number of problems: increasing the burden of production on the environment; the need to build powerful treatment plants; inefficiency of traditional

methods of wastewater treatment, etc. Leather production can deplete natural resources, pollute water bodies and soil, and change the ecological characteristics of the territory. That is why environmental aspects are crucial for improving the technological processes of leather production.

Theoretical foundations of the study.

In the leather production, the dermis is the main object of chemical, physic-chemical and mechanical transformations. The main protein of the dermis is collagen. During the execution of technological processes, the structure of collagen changes. As a result of processing, the bonds in the protein itself are broken or formed; a new spatial structure appears, and so on.

Leather technology is used 70 % liquid. The processes are carried out in working solutions using water and a complex of chemical materials. As a result of processing a large amount of waste liquids is formed. Liquids contain a significant amount of unused chemical materials that can pollute the environment.

The technological cycle of natural leather production includes preparatory, tanning, semi-finishing and finishing processes and operations. The main indicators of the quality of natural leather are formed during tanning processes. Traditionally, chromium compounds are used for tanning leather [12]. About 90 % of natural leather in the world is made using chromium compounds. Chromium compounds are the most available, relatively cheap, universal and effective tanning material. But there are a number of environmental problems associated with the ingress of chromium into the company's wastewater. The problems are due to the fact that a third of the chromium compounds used in production are in waste solutions [7]. The release of chromium salts into nature causes pollution and irreversible changes in the ecosystem. Chromium is a necessary element involved in metabolism and metabolism in humans. But high concentrations of chromium are toxic. Chromium (VI) compounds are today among the most dangerous pollutants in the aquatic environment [1].

Leather tanneries discharge wastewater into reservoirs only if sanitary requirements are met. The main indicator of the amount of pollutants in wastewater is the value of biological oxygen demand (BOD). The indicator characterizes the pollution of wastewater with organic matter and ammonium compounds. But it is impossible to be limited to one indicator of BOD. A clearer idea of the total pollution of industrial wastewater is given by the indicator of chemical oxygen demand (COD). The indicator characterizes wastewater pollution by organic and inorganic compounds. Determining the indicators of BOD and COD makes it possible to assess the ability of wastewater to biodegrade. Indicators indicate the chemical and biological impact of technology on the environment.

The reducing the environmental impact of wastewater from leather tanneries on the environment can be solved by completely abandoning the use of chromium tanning in the technological cycle or partial replacement of chromium tanning with alternative eco-friendly compounds.

One of the innovative areas of greening of leather production is the partial replacement of chromium compounds with other structuring compounds [2, 3, 8]. In practice, often use aluminum, zirconium or titanium tanning agents, synthetic tanning agents, water-soluble polymer compounds, materials of natural origin. The use of natural highly dispersed minerals, such as montmorillonite, for tanning is promising.

The purpose of the work – to determine the environmental efficiency of the technology of production of leather obtained using modified montmorillonite.

Experiment.

The object of research - the process of forming the properties of leather in the tanning process using modified montmorillonite.

The subject of research - studying the environmental friendliness of tanning technology using modified montmorillonite.

The main tasks of the work:

- testing of tanning technologies in the laboratory,
- evaluation of the effectiveness of the formation of the structure of the dermis of natural leather,
- evaluation of the ecological condition of waste tanning solutions.

Grain split was used to obtain leathers in the study. Pelt was obtained from raw materials of cattle after the pickling process. The technological scheme of obtaining pelt provided for the processing of raw materials according to the traditional technology of leather production for upper shoe [4].

The basic chromium sulfate with basicity 33 % was used as a chromium tanning agent.

Bentonite clays of Dashukovsky deposit (Ukraine) was used for investigation. Montmorillonite dispersion was modified in stages by sodium carbonate and basic chromium sulfate.

Physic-chemical and physic-mechanical methods were used to evaluate the effectiveness of montmorillonite during tanning [5]. The effectiveness of the use of modified montmorillonite to improve the environmental friendliness of the tanning process was evaluated by the level of BOD and COD. In the work determined the degree of development of tanning solutions [5].

To obtain leathers the traditional method of tanning with chromium compounds was used to obtain leathers. The total amount of chromium tanning agent for tanning was 1.8% of chromium oxide by weight of the pelt.

Modified montmorillonite dispersion was used for the alternative tanning method. To obtain dispersion, montmorillonite was dispersed with sodium carbonate. The consumption of sodium carbonate for dispersion was 6% of the dry weight of the mineral. The resulting montmorillonite dispersion was treated with chromium sulfate. The treatment was performed to cation the surface of the montmorillonite particles. The consumption of chromium oxide for cationization was 10% by weight of the mineral. The resulting dispersion was used for tanning in the amount of 1.25% of dry mineral by weight of the pelt.

Pelts for tanning were formed into two treatment options. The tanning of was carried out according to the standard technology leather for shoes [4]. The technology involved the implementation of the tanning process, increasing the basicity of tanning compounds, laying of the semi-finished product after tanning.

Studies of quality indicators were performed on samples of tanned leather after fat-liquoring and drying. Preparation of samples for research was performed in accordance with the requirements of regulations. Preparation for chemical analysis was carried out according to State Standard of Ukraine ISO 4044: 2020, for physical and mechanical tests – according to State Standard of Ukraine EN ISO 2419: 2020.

The quality of the experimental leathers was determined according to the indicators of State Standard of Ukraine 2726-94 "Upper Leather. Specifications".

Results and discussion.

The presented results of the comparative characteristics of the leather quality allow us to assess the effectiveness of tanning using modified montmorillonite (Table 1).

Table 1 - Indicators of quality of natural leather and characteristics of the tanning process

№	Index	Technology:		Relative changes in indicators *, %
		unified	alternative	
1	Consumption tannin agent, %, by weight of the pelt	1,8	1,25	-30,6
2	Exhaustion of tanning solution, %	57,4	69,5	-17,4
3	Shrinkage temperature, °C	112	106	-5,4
4	Moisture content in the leather, %	11,3	12,1	+6,6
5	Chromium oxide content in the leather, %	4,3	4,7	+8,5
6	Protein substance in the leather, %	72,5	60,1	-17,1
7	Yield of area, %	100,0	104,9	+4,9
8	Rigidity of the leather, cH	2,3	1,9	-17,4
9	Air permeability of the leather, cm ³ /cm ² per hour	648,0	985,0	+34,2
10	Indicator of BOD, mg O ₂ /l	1478,3	1357,6	-8,2
11	Indicator of COD, mg O ₂ /l	6365,5	4242,6	-33,4
12	Correlation of BOD / COD	0,23	0,32	+28,1

*– a “minus” sign indicates a decrease in the indicator, a “plus” sign indicates an increase in the indicator

Analysis of the data in table 1 shows the high quality of the leathers of the alternative method of tanning. The results are achieved even by reducing the amount of tanning. Reduction of tanning agent compared to standard technology is significant and is 30.6%. Reducing the amount of tanning did not affect the formation of heat resistance of the leather. The welding temperature of the experimental leathers is 106 °C. Requirements for the formation of a certain level of shrinkage temperature (more than 100 °C) of chrome shoe leather are met.

Analysis of the indicators indicates an increase in the degree of development of chromium compounds during tanning in the case of montmorillonite by 17.4%. In our opinion, the increase in the efficiency of derma absorption of chromium compounds is due to the presence of a highly dispersed mineral. Montmorillonite has a highly developed sorption surface and creates additional active centers in the dermis structure for binding to

chromium compounds. Additional bonding helps to efficiently test the working solutions and reduce the load on the environment. The result of additional sorption of chromium in the presence of montmorillonite is also an increase in the content of chromium oxide in the leather by 8.5% compared to unified technology.

The effective formation of the dermis structure in the technology of tanning with the use of modified montmorillonite has been revealed. The analysis of the indicators shows an increase in leather yield by area of 4.9%, an increase in leather softness by 17.4%, air permeability by 34.2%. The growth is due to the properties of modified montmorillonite. During the modification of the mineral with alkaline reagents, structural sizes of montmorillonite of different sizes are formed. Particles of modified montmorillonite contribute to the formation of the structure at the level of ultra-, micro- and macropores [10]. The adhesion of the collagen structure of the dermis is reduced. This helps to increase the formation of the structure of the dermis as a whole.

In order to assess the environmental friendliness of the technologies used in the study, the ability of waste liquids to biodegrade was determined. The analysis of the level of BOD and COD indicators of waste liquids shows a decrease in the indicators for tanning technology with modified montmorillonite. In comparison with the typical tanning technology, the BOD indicator decreases by 8.2%, and the COD indicator – by 33.4%. The decrease in indicators indicates an improvement in the biodegradability of wastewater.

An important indicator of reducing the eco-destructive impact of leather production on the environment is the level of the ratio of BOD / COD. According to this indicator, the ability of wastewater to biodegrade is estimated in the range from 0 to 1 [6, 11, 13, 14]: BOD / COD less than 0.3 – wastewater is very difficult to biodegrade, the company needs to involve excipients (coagulants or flocculants, etc.); BOD / COD is 0.3-0.6 – wastewater is considered potentially biodegradable within a certain period of time; BOD / COD is greater than 0.6 – wastewater is capable of self-biodegradation and does not have a negative effect on the environment.

According to the typical tanning technology, the ratio of BOD / COD is 0.23, according to the alternative – 0.32. The wastewater of typical chromium tanning technology should be classified as liquids that are difficult to biodegrade. Wastewater from tanning technology using modified montmorillonite is considered potentially biodegradable within a certain period of time. Reduction of eco-destructive impact on the environment of the alternative technology is significant. The ability of wastewater to biodegrade increases by 28.1% compared to standard technology. The data indicate the expected savings of the leather company for wastewater treatment using alternative tanning technology, which will be the focus of further research.

Conclusions.

The efficiency and environmental friendliness of the introduction of chromium tanning with the use of modified montmorillonite were evaluated.

The use of alternative tanning technology ensures high quality leather. Compared with the typical technology, there is a decrease in leather rigidity by 17.4%, an increase in air permeability of the leather by 34.2%. The increase in the yield of leathers of the alternative tanning by area by 4.9% predicts an increase in the company's profit.

The reduction of ecological impact on the environment as a result of partial replacement of chromium compounds has been established. The statement is proved by a decrease of 30.6% in the consumption of chromium compounds for tanning, an increase of 17.4% in the degree of their development. An increase in the ability of wastewater to biodegrade due to a reduction in the level of biological oxygen consumption by 8.2% and chemical oxygen consumption by 33.4%. Reduction of ecological load on the environment as a result of application of tanning with use of the modified montmorillonite makes 28,1%. Wastewater are considered to be potentially biodegradable.

The environmental friendliness of the technology of tanning leather with the use of modified montmorillonite is justified by: partial replacement of chromium compounds during tanning; increasing the degree of absorption of chromium compounds; reducing the negative impact of leather production on the environment; the expected reduction of the company's costs for wastewater treatment; reduction of biological and chemical oxygen consumption.

Prospects for research.

Further studies of the implementation of chromium tanning using modified montmorillonite will be aimed at evaluating the cost-effectiveness of the proposed method of tanning using modified montmorillonite at the stage of tanning.

It is also advisable to continue research in the direction of:

- replacement of chromium sulfate in the modification of montmorillonite with compounds of other metals (for example, aluminum);

- study of the targeted effect of montmorillonite dispersions on the transformation of the collagen structure of the dermis during tanning;
- achieving a greater degree of testing of working tanning solutions.

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