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ORSID 0000-0002-4602-9883

ORSID 0000-0003-2362-2876

TEACHING STUDENTS LIFE SAFETY IN CONDITIONS OF EMERGENCY SITUATIONS IN THE COURSE OF STUDYING EDUCATIONAL COMPONENT «SAFETY SCIENCE»

Оксана Кудря,

кандидатка педагогічних наук, доцентка, завідувачка кафедри виробничо-інформаційних технологій та безпеки життєдіяльності

Полтавського національного педагогічного університету імені В. Г. Короленка;

Валерій Титаренко,

кандидат педагогічних наук, доцент кафедри виробничо-інформаційних технологій та безпеки життєдіяльності Полтавського національного педагогічного університету імені В. Г. Короленка

У статті розглянуто питання щодо навчання студентів безпеці життєдіяльності в умовах надзвичайних ситуацій у межах освітнього компоненту «Безпекознавство».

Відзначено, що навчання здобувачів вищої освіти безпеки життєдіяльності в умовах надзвичайних ситуацій на сьогоднішній час необхідно приділяти значну увагу, адже змістове наповнення освітнього компоненту «Безпекознавства» дозволяє ознайомити майбутніх фахівців із класами, підкласами та групами надзвичайних ситуацій, з особливостями створення та діяльності Державних комісій із надзвичайних ситуацій, зі специфікою функціонування Єдиної державної системи цивільного захисту та організації життєзабезпечення населення в умовах надзвичайних ситуацій, з проведенням робіт з ліквідації наслідків надзвичайних ситуацій.

У статті окреслено можливості формування у студентської молоді знань щодо необхідних заходів із рятування людей, надання їм першої долікарської допомоги та евакуації до медичних установ. Наголошено на особливій доречності висвітлення нині в навчальному процесі питань надання першої долікарської допомоги людям при кровотечах, вивихах, переломах, термічних та хімічних опіках, отруєнні речовинами різного походження. Проведено висновок щодо того, що подальших наукових розвідок та впровадження у навчальний процес вимагає питання базових правил безпеки під час війни. Передбачено розробку низки алгоритмів дій щодо поведінки в разі хімічної небезпеки, радіаційної аварії, під час воєнних дій.

Ключові слова: *безпекознавство, навчальний процес, безпека життя і діяльності, надзвичайна ситуація, перша долікарська допомога.*

Formulation of the problem. An essential task of life safety is related to human health and life protection and their living environment, the development and implementation of appropriate means and measures to create and maintain healthy and safe living conditions and activities.

Every day, thousands of events happen in the world. It disrupts the standard living conditions of people, leading to their death or significant material losses. These events are referred to as «emergencies.» Emergencies are characterized by people's deaths or their threats, deterioration of their living and working conditions, causing economic damage, and significant environmental deterioration. Emergencies can be caused by accidents, catastrophes, natural disasters, and other events, such as epidemics, terrorist acts, armed conflicts, etc.

A coronary virus pandemic swept the world in 2020. The lives of Ukrainians have radically changed over the past two years. The COVID-19 pandemic has significantly affected the labor organization in various areas and caused changes in lifestyle, leisure, and communication.

Currently, the issues of acquainting students with life safety in emergencies, and their mastery of the basics of first aid to victims of Russian aggression in Ukraine are crucial.

Analysis of recent research and publications. P. Atamanchuk, M. Vereskliia, S. Hordenko, and N. Mekhalitska considered life safety as a branch of safety science in their works. Issues of life and labor safety were covered by M. Zorina, O. Hornostai, and O. Mirus, N. Avramenko, N. Lutak, I. Sahaidak, V. Tytarenko, and others considered a number of issues of teaching students safety science in their papers. They considered the features of studying information about natural hazards of the environment in the context of a corona virus pandemic.

P. Volianskyi, O. Barylo, S. Huriev, M. Dolhyi, O. Yevsiukov, N. Iskra, V. Mykhailov, S. Poteriayko, A. Terentieva paid attention to the issues of survival in emergency situations. V. Ziuz, T. Babych, and V. Balukhtina analyzed the peculiarities of teaching students the basics of first aid in their publications.

The purpose of the article. The aim of the article is to analyze the content of the educational component «Safety Science» within the issues of life safety in emergency situations.

Presenting main material. The discipline «Safety Science» occupies a significant place in the process of training specialists with a bachelor's degree. The syllabus of this discipline provides students with mastery of the categorical apparatus of life safety, acquaintance with natural and man-made hazards of the environment, socio-political hazards, their types and characteristics, social hazards, including social conflicts using conventional weapons and means of destruction (Сагайдак, Авраменко, & Лутак, 2016).

According to the Civil Protection Code of Ukraine, an emergency situation is defined as «a situation on a separate territory or business entity on it or a water body, which is characterized by the violation of normal living conditions caused by a catastrophe, accident, fire, natural disaster, epidemic, epizootic, epiphytosis, use of means of destruction or other dangerous events that have led (may lead to) a threat to life or health of the population, a large number of the dead and injured, causing significant material damage, as well as the inability of the population to live in such an area or facility, conducting economic activity on it» (*Кодекс цивільного захисту*, 2022).

The greater the number of people affected by an emergency appears, the greater area is covered by it. Given this, the classification of emergencies by their scale is based on the territorial principle. According to it, emergencies can be local, object, regional, national, continental, and global.

The situation in Ukraine regarding dangerous natural phenomena and catastrophe accidents is difficult. Experts note the growing number of emergencies and the severity of their consequences. It is a significant threat to the security of individuals, society, and the environment that negatively affects economic stability.

According to the current Resolution of the Cabinet of Ministers of Ukraine dated March 24, 2004, № 368 «On approval of the Procedure for classification of emergencies», there are four levels of emergencies, i.e., state, regional, local, object (*Про затвердження Порядку*, 2004).

In Ukraine, there is an emergency classifier. It identifies a 5-digit code that indicates the class, subclass, and group of emergencies. The following classes of emergencies are distinguished: man-made emergencies (code 10000), natural emergencies (code 20,000), social emergencies (code 30,000) and military emergencies (code 40,000). Specific groups of emergencies are within each class (*Класифікатор надзвичайних ситуацій*, 2010).

Prevention of emergencies is to prepare and implement a set of legal, socio-economic, political, organizational and technical, sanitary and hygienic and other measures aimed at regulating safety, assessing the level of risk, timely response to the threat of emergency based on monitoring data, examinations, research and forecasts on the possible course of events in order to prevent them from escalating into an emergency or mitigate its consequences.

The above functions in our country are performed by the Unified State Civil Protection System, approved by the Resolution of the Cabinet of Ministers of Ukraine № 11 «On approval of the Regulations on the unified state civil protection system» dated January 09, 2014. Depending on the scale and features of the projected or emerging emergency, one of the following modes of functioning of the unified state system of civil protection is established in Ukraine or within its specific territory: daily functioning; increased readiness; emergency situation; state of emergency (*Про затвердження Положення*, 2014).

In order to organize the livelihood of the population in emergency situations and to organize work to eliminate the consequences of accidents, catastrophes, and natural disasters, the State Commission for Emergencies is created. It operates under the Cabinet of Ministers of Ukraine in regions, cities, and districts on a permanent basis and in case of emergency.

The organization of life support of the population in conditions of an emergency situation is a complex of actions directed at the creation and maintenance of conditions for the life, health, and working capacity of people.

Emergencies result in the destruction of houses, buildings, and roads, contamination of the area with radioactive and chemical substances, flooding, fires, etc. People can find themselves in blockages, damaged, flooded, or burning houses, and other unforeseen situations.

Therefore, measures are needed to rescue people, provide them with first aid, and evacuate them to medical facilities.

According to the WHO, nearly 30% of people who died in accidents and emergencies could have been saved if they had been treated and taken to the hospital on time. Currently, in the context of hostilities, this percentage, due to various circumstances, can be much higher. Therefore, the ability to provide first aid to victims is becoming more relevant, especially for student youth (Зюзь, Бабич, & Балухтіна, 2020, с. 66).

First aid is a set of simple urgent actions aimed at preserving the injured person's health and life. The person providing first aid must be able to assess the injured person's condition and determine the type of care they need, ensure free patency of the upper respiratory tract, perform mouth-to-mouth or mouth-to-nose resuscitation and external cardiac massage and evaluate their effectiveness, stop bleeding by applying a tourniquet, or finger pressure on the vessels, apply a bandage for injuries (wounds, burns, frostbite, bruises), provide assistance in case of sunstroke and heat stroke, drowning, poisoning, loss of consciousness, determine the need to remove the victim by ambulance or associated transport and use the first aid kit (*Як надати*, 2018).

The brain center of consciousness can be damaged due to various injuries, severe pain, and blood loss, lack of oxygen, freezing, and overheating. It leads to different states of the body, i.e., shock, dizziness, fainting, as well as cardiac arrest, and death.

Bleeding is damage to blood vessels due to a mechanical or pathological disorder. They are external and internal, as well as arterial, venous, and capillary. Bleeding should be stopped immediately, using a compression bandage, but should be treated with iodine or alcohol solution around the wound. Imposing a rubber plait at arterial bleeding is made to temporarily stop it.

Dislocation is a persistent displacement of the ends of the bones beyond their normal mobility. In case of dislocations, it is possible to rupture the joint bag and ligament and exit one of the bones from the bone bag. A person with a dislocation needs to be quickly transported to a hospital. However, a splint or bandage must be put on to secure the limb.

A fracture is a violation of bone integrity. Fractures can be closed or open. The first aid for fractures is to ensure the complete rest of the injured part of the body and eliminate the mobility of bone fragments at the fracture site. To this end, it is necessary to immobilize the injured part of the body by applying a restraining bandage or transport splint. When the clavicle is fractured, a large bundle of twisted cotton wool is placed in the axillary fossa. The arm should be bent at the elbow at a right angle and tightly bandaged to the torso. The forearms should be hung on a scarf around the neck. A tight bandage is put around the lower part of the chest to restrict its mobility during breathing if it is a rib fracture. The victim must be transported sitting down. A fracture of a backbone provides immobility of a backbone. For this purpose, the victim is placed on a stretcher with a hard surface in a supine position. A roller is placed under the shoulders and head. If the cervical spine is broken, the victim's head should be secured with a cotton bandage in the form of a collar and then placed on a stretcher. If pelvic bones are broken, the victim is placed face-up on a hard surface, his legs are given positions of 'a frog' for which thick rollers are placed under the knees. A wide towel should be used to tighten the pelvis and upper thighs. We should urgently take the victim to a medical facility.

Frostbite is caused by prolonged exposure to cold and occurs when the body comes into contact with metal in the cold, with liquefied air and gases. As for the degrees of frostbite, there are

four of them: I – redness and swelling; II – blistering; III – necrosis of the skin and scab formation; IV – necrosis of the body parts. Medical aid is rubbing and warming with alcohol, vodka, a soft glove, or a fur collar. If the injured person overheats, they should be put in a shaded place and given an unlimited amount of drink. In severe cases, it is necessary to wash with cold water and apply cold compresses on the head, neck, and heart.

Thermal burns are caused by exposure to exposed areas of the body at high temperatures (flames, hot liquid on the skin, hot objects). Depending on the severity, there are four degrees of burns, i.e., I – redness and swelling of the skin; II – blisters filled with yellowish liquid; III – the formation of skin necrosis (scabs); IV – charring of body tissues. Burns are always accompanied by severe pain in the injured part. Burns 1/3-1/2 of the body surface and more are life-threatening. It is necessary to quickly remove the victim from the fire area and stop contact with hot substances. It is required to put a cotton gauze bandage on the burned body surface if there is a 0,5% solution of Novocain. You can use it to irrigate the burnt surface. If the burns are not deep, they are limited to lubricating the burned part of the skin with 2-3% potassium permanganate solution and putting a sterile bandage. Victims with severe burns should receive an unlimited amount of drinking, namely water-salt solution (one teaspoon of salt and 1/2 teaspoon of soda per 1 liter of water), hot and sweet tea. To reduce pain, give a painkiller and take the injured person to a hospital.

Chemical burns occur due to exposure to the respiratory tract, skin, and mucous membranes of concentrated inorganic and organic acids, alkalis, phosphorus, and other substances. It is necessary to immediately wash away the chemicals that have got on the skin with a stream of water until the specific smell disappears, then the burned parts are washed with the following solutions: in cases of acid burns, – it is a 2% soda solution or soapy water; in case of alkali burns, it is 1–2% solution of acetic, citric or boric acid. In the case of phosphorus burns, it is advisable to make lotions from a 5% potassium permanganate solution. Then a dry bandage is placed on the burned surface. If the chemical enters the respiratory tract, it is necessary to rinse the throat with an aqueous solution of boric acid and rinse the eyes with the same solution. In case of burns to the esophagus and stomach, you should drink eggs or sunflower oil. If the substance caused the burn is not known, a dry bandage should be put on the burn site, and the victim should be taken to a hospital immediately.

Poisoning is a group of diseases caused by exposure to poisons of various origins. In case of poisoning, you should call a doctor immediately. If the poison (except acids or alkalis) enters the gastrointestinal tract, the victim should be rinsed immediately. It is necessary to drink 1.5-2.0 liters of water with potassium permanganate or water with baking soda. If the poison enters the respiratory tract, the victim must be provided with fresh air, freed from clothing that makes breathing difficult. If the poison gets on the skin, you should immediately wash the body with soap and water. In case of food poisoning, the stomach should also be rinsed immediately. Poisoning by acids or alkalis causes sharp pains in the mouth, esophagus, and stomach, burns or swelling of the mucous membranes, blood vomiting, and difficulty swallowing. It is necessary to give a patient 2-3 glasses of water to dilute the acid or alkali and thus reduce their effect. If there are signs of suffocation, perform artificial respiration. In the case of carbon monoxide poisoning, there is dizziness, nausea, vomiting, tinnitus, and weakness. It is necessary to act in the case of respiratory poisoning.

Timely provision and proper first aid are aimed at saving the life of the victim, which has a positive effect on the further successful treatment and prevents the development of serious complications.

Conclusions. Thus, the issue of teaching students life safety in emergencies should be thoroughly considered today. The content of the educational component «Safety Science» allows students to get acquainted with classes, subclasses, and groups of emergencies, the establishment and operation of State Commissions for Emergencies, the peculiarities of the Unified State Civil Protection System, organization of life support in emergencies and organization of work to eliminate the consequences of these emergencies.

It is crucial to develop students' knowledge of the necessary measures to rescue people and provide them with first aid and evacuation to medical facilities. It is especially relevant today to

cover the issues of providing assistance to people with bleeding, dislocations, fractures, thermal and chemical burns, and poisoning by poisons of various origins.

Further research and implementation in the educational process require the issue of basic safety rules during the war. It is planned to develop a number of algorithms for behavior in case of chemical danger, radiation accident, during hostilities.

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**TEACHING STUDENTS LIFE SAFETY IN CONDITIONS OF EMERGENCY
SITUATIONS IN THE COURSE OF STUDYING EDUCATIONAL COMPONENT
«SAFETY SCIENCE»**

Oksana Kudria,

Candidate of Pedagogical Sciences, Associate Professor,
Head of the Department of Industrial Information Technologies and Life Safety
of Poltava V. G. Korolenko National Pedagogical University;

Valeriy Tytarenko,

Candidate of Pedagogical Sciences, Associate Professor of the Department of Industrial
Information Technologies and Life Safety of Poltava V. G. Korolenko
National Pedagogical University

The article considers the issue of teaching students life safety in emergencies within the educational component «Safety Science.»

It is noted that the pandemic of the corona virus spread to the whole world in 2020. For two years, the lives of Ukrainians have changed radically. The COVID-19 pandemic has significantly affected the work and income of the population and caused changes in lifestyle, leisure, and communication.

The urgency of the issue of acquainting student youth with life safety in emergencies is noted. It is noted that the discipline «Safety Science» occupies an essential place in the course of training specialists with a bachelor's degree.

The syllabus of this discipline provides students with mastery of the categorical apparatus of life safety, acquaintance with natural and man-made hazards of the living environment, socio-political hazards, and social hazards, including social conflicts using conventional weapons and weapons of mass destruction.

Considerable attention should be paid to the issue of teaching students life safety in emergencies. The article considers the content of this topic. The definition of the category «emergencies» is given, and their division into classes is considered. The peculiarities of the creation and activity of the State Emergency Commissions are analyzed. The peculiarities of the functioning of the Unified State System of Civil Protection are considered.

The article also considers the specifics of the organization of people's lives in emergencies, and measures to eliminate their consequences. It is noted that due to emergencies that destroy houses, buildings, roads, contamination of the area with radioactive and chemical substances, flooding, fires, etc., people may find themselves in blockages, damaged, flooded, or burning houses, and other unforeseen situations. As a result, measures are needed to rescue people, provide them with first aid, and evacuate them to medical facilities. At present, in the conditions of hostilities, the ability to provide first aid to victims is gaining relevance. It is crucial to develop such skills in the younger generation; considers the possibilities of forming students' knowledge about the necessary measures to rescue people, provide them with first aid, and evacuate them to medical institutions. Particularly relevant in the current martial law coverage in the educational process of first aid for people with bleeding, dislocations, fractures, hypothermia, frostbite, thermal and chemical burns, and poisoning by poisons of various origins. Timely provision and proper conduct of first aid are aimed at saving the life of the victim, which has a positive effect on the further successful treatment and prevents the development of serious complications.

The issue of basic safety rules during the war requires further scientific research and implementation in the educational process. It is planned to develop several algorithms for action in case of chemical danger, radiation accident, and behavior during hostilities.

Keywords: *safety science, educational process, safety of life and activity, emergency situation, first aid.*

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