# PROSPECTS OF HEALTH AND SAFETY EDUCATION IN SCHOOLS OF UKRAINE

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#### Abstract

One of the strategic directions of society's development is safety and health education. Researching the perspective of school safety and health education involves identifying trends in the types and number of hazards. Death and disease statistics have become obsolete with the addition or expansion of certain topics. Research has shown that a significant number of issues that are relevant to people are not included in the health and safety curriculum. Some topics are not given enough attention. In addition, not enough attention is paid to the topic of professional bad habits and the formation of a healthy lifestyle. Issues relevant to health and longevity are not included in the training. Issues of suicide prevention are not included in the training programs. In connection with Russia's war against Ukraine, to the subject "Basics of Health" and the integrated course "Health. security and well-being" more than 30 topics were added to prevent the risks that arise during war.

Further transformation and development of safety, health and welfare education will take several directions. First, it is an improvement in the level of personal and collective security against man-made and natural threats. Secondly, it is an improvement in the level of security associated with the virtual environment and information technologies. It treats the formation of a healthy lifestyle to improve the quality of life and extend active longevity. Fourth, it is protection against threats that are offered unexpectedly, for example, protection against military threats that arose as a result of Russia's war against Ukraine.

Keywords: Health, safety, education, schools, prospects, Ukraine.

#### 1 INTRODUCTION

Safety and health education is one of the strategic directions in the development of society. The purpose of health and safety education is to:

- Reducing the risk of premature mortality and injury;
- Reducing the number of diseases;
- Increase in life expectancy, including active life;
- Improvement of standard of living.

Safety and health education has a positive impact on the formation of tolerance in society, the formation of safety culture, health culture and ecological culture. Health and safety education has direct and indirect effects on the economic sphere, including social costs, the social sphere, including crime rates, etc. This education is a necessary component of the stable development of society.

In Ukraine, safety and health education is implemented in elementary, middle and high school and in some higher education institutions. Separate elements of safety and health education are carried out in preschool institutions. The most attention is paid to health and safety education in secondary school (grades 5-9). Safety and health education is provided in the Essentials of Health subject and the integrated Health, Safety and Wellbeing course. The Integrated Health, Safety and Wellbeing course is gradually replacing the Essentials of Health subject. In the 2023-024 academic year, pupils of the 5th and 6th grades will study the programs of the integrated course.

The effectiveness of achieving the goal of safety and health education depends on the subject. The topic of health and safety education should directly depend on the types and number of hazards and diseases. In addition, it is necessary to take into account trends in the emergence of new dangers and the strengthening of existing dangers. The same trends should be taken into account in relation to diseases.

The purpose of this study was to determine the appropriateness of learning topics in comparison with the possible problems with which students of education have encountered now or will encounter in the future.

#### 2 METHODOLOGY

The determination of the types and level of existing hazards and diseases was carried out with the help of statistical analysis. Changes and trends in non-occupational injuries and deaths depend on the type, frequency and severity of hazards. Determination of prospects in the development of hazards for people was carried out using extrapolation. It is possible to assess the possible development of hazards and the magnitude of their impact using the theory of probability. Analysis of trends and forecasts of human morbidity in individual regions was carried out using statistical analysis and extrapolation.

A comparison of the types, frequency and intensity of hazards with the subject of safety and health education was carried out with the help of comparative and content analysis. Content analysis and comparison were used in the study of course programs recommended by the Ministry of Education and Science of Ukraine. The subject of military hazards in safety and health programs was studied separately. A comparative analysis of the topic of prevention and protection against military dangers makes it easy to single out the necessary content, add one or another topic that is important from the point of view of operational circumstances related to war.

#### 3 RESULTS

## 3.1 Dangers in human life (On the example of Ukraine)

People face various dangers every day. These dangers depend on a number of factors:

- Region of residence,
  - Natural and climatic conditions;
  - Social and political situation;
- Professional activity;
- Person's age;
- Hobby;
- Habit;
- Psychological features;
- Character;
- Physiological features
- Gender.

These factors are divided into external and internal. Some of the external factors are formed with the participation of people. In particular, it is the choice of a professional activity that can be more or less safe. A person's hobby is also his choice. There are hobbies with different levels of risk. For example, rugby is characterized by a high level of injuries [1]. According to various agencies, base jumping [2] and mountain climbing (free soloing) are considered to be one of the most dangerous sports. Differences in risk assessments of a particular sport are based on differences in risk assessment methodology. In some cases, the total number of injuries is estimated. Other researchers consider only fatal injuries that lead to death or disability as the basis of the assessment.

The region where people live is characterized by natural features. In many regions, there is an increased level of natural hazards, including: floods, hurricanes, volcanic eruptions, tsunamis, epidemics, etc. The social and political situation in the region affects the presence of specific risks, in particular those related to hostilities, poverty, hunger, lack of proper medical care, etc.

A person's age affects not only the risk of developing diseases. Some diseases are characteristic of children. In older age, the risk of diseases increases. The risk of diseases is influenced by natural and social factors, human habits, gender, individual physiological characteristics, etc.

Part of the risks directly depends on internal factors. The character and habits of a person, his psychological and physiological features in many cases form a complex of specific risks.

The main causes of mortality in Ukraine are non-infectious and infectious diseases. On average, for 2020-2021, the percentage of people who died due to diseases is 90.4%. It should be noted that a significant number of deaths are associated with diseases that develop in older people. However, a significant part of diseases arises as a result of bad habits. Most often, people die from causes related to alcohol consumption (Figure 2). Such cases averaged 11.8% in 2003-2011. In 2021, this indicator decreased to 8.4%.

Analysis of statistical data showed that in the structure of total mortality in Ukraine, mortality from various emergency situations is 7.75% per year on average (1990-2011). On average, for 2020-2021, the percentage of people who died from external causes of death is 4.33% (Class XX. External causes of mortality) [3]. We are observing a decrease in the mortality rate from external causes in Ukraine.

The analysis was based on data before the start of a full-scale war. Thus, the calculations did not include data on military risks. The analysis also revealed a change in the coding of statistical data, which led to the impossibility of comparing some indicators.

In the structure of mortality from external causes, cases related to non-production factors predominate in 97.7% (Fig. 1). Mortality due to industrial causes is 1.6% (Fig. 1) of the total mortality due to external factors. This is related to ensuring labor safety at enterprises. Mortality due to accidents is only 0.7% (Fig. 1). First of all, this is due to the relatively small number of emergency situations. Emergency situations in Ukraine are often less intense and cause less damage, resulting in fewer deaths and injuries. It should be noted that Ukraine has a sufficient network of the State Emergency Service. The low level of mortality from emergency situations is, among other things, a consequence of the activities of the State Emergency Service.

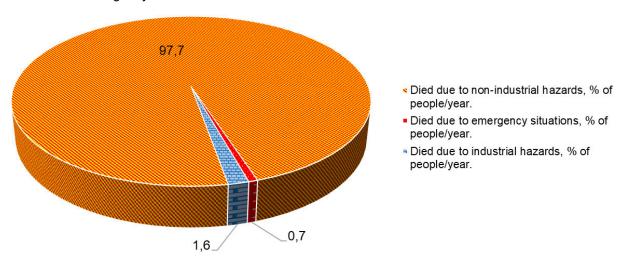


Figure 1. The structure of mortality from external causes. (Ukraine, 2006-2011) According to the State Emergency Service and the State Statistics Committee of Ukraine.

Mortality from external causes is small compared to mortality from diseases. Safety and health training is aimed at reducing morbidity, mortality and injuries from non-industrial causes. Therefore, it is worth considering the structure of non-productive mortality, which is shown in Fig. 2.

The main cause of mortality from non-productive causes is suicide (intentional self-harm). In the past, the percentage of suicides averaged 18.4%. In 2021, 20.5% of suicides from the total number of deaths from external factors were observed. The second place is occupied by traffic incidents. In 2006-2011, their number was 14.9%, and in 2021 it decreased to 12.9%. The third largest cause of death from external non-productive factors is related to alcohol. Thus, the statistical information makes it possible to outline the main three areas of training for the prevention and prevention of non-occupational deaths and injuries. Next in importance is the topic of injury and death prevention training, which is associated with hazards that cause 4% to 7% of deaths. Among them: cases related to drowning, fires, poisoning and action of natural factors (Fig. 2). Criminal dangers should be noted separately. The number of murderous attacks in Ukraine has decreased. On average, in 2006-2011, the percentage of criminal threats was 6.4%, and in 2021, this percentage decreased to 4.2%.

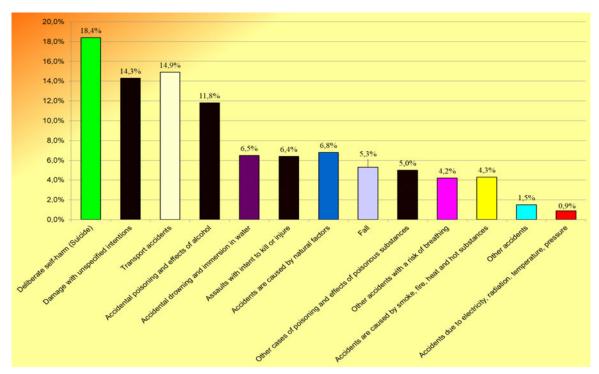


Figure 2. The structure of non-occupational mortality. (Ukraine, 2006-2011)
According to the State Emergency Service and the State Statistics Committee of Ukraine.

The causes of child mortality are quite different from the causes of mortality for adults. Chart 3 (Fig. 3) presents a comparison of the causes of child and general mortality. Infant mortality statistics influence the subject for younger schoolchildren. In addition, these topics should be studied in high school to ensure the safety of future children. High school students will become parents in a few years. They desperately need knowledge on child safety. In general, a special parenting course is needed in Ukrainian education today. This course should be mandatory for all students and contain not only information about education, ensuring the safety and health of children, but also about relationships, household chores, nutrition, etc.

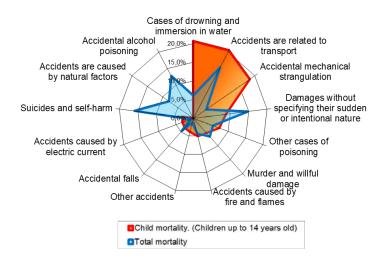


Figure 3. Comparison of causes of child and adult mortality. (Effect of external factors). According to the State Emergency Service and the State Statistics Committee of Ukraine.

The biggest danger for children is water. 20.7% of all accidents (which led to death) with children are related to water (Fig. 3). For adults, this figure is only 6.5%. Traffic accidents and accidental mechanical suffocation pose a great danger to children. Unfortunately, statistics record data on all children from birth to 14 years of age. It would be important to consider separately the statistics for children who are completely dependent on the attention of their parents. These are children up to 2-3 years old. Children

3-6 years old and children from 6 to 16 years old. The best data would be if we had statistics not only according to the age of the child, but also according to the location and circumstances of the incident. This would make it possible to optimize training on the prevention of risks from external causes. It would be possible to single out risks that parents do not take into account. Accordingly, include such risks in high school education or in a special parenting course.

War risks should be mentioned separately. In Ukraine, from the beginning of the full-scale aggression until June 1, 2023, more than 1,476 children were injured. 484 children died and more than 992 were injured of various degrees of severity [4]. These data do not take into account the dead in Mariupol and many other cities, including those settlements that are under occupation. In addition to physical risks, children face a number of mental risks during war. These risks are especially strong for those children who were under fire.

## 3.2 Content of health and safety education in Ukraine

In Ukraine, safety and health education is implemented mainly through the subject "Basics of Health" and the integrated course "Health. safety and well-being". These subjects are taught in secondary school. In higher education institutions, security issues can be included in various subjects. In the past, all institutions of higher education in Ukraine had a separate mandatory course "Life Safety". Education in Ukraine is currently in a state of reform. The school is transitioning from the old system to the so-called "New Ukrainian School." As part of this transition, the "fundamentals of health" subject is gradually being replaced by an integrated "Health, Safety and Wellbeing" course.

In most institutions of higher education, the subject "Life safety" has completely disappeared. Some safety issues are studied by students as part of special courses, a course on labor protection or civil protection. Some higher education institutions have retained the Life Safety course, or similar courses with other names. These courses addressed natural, social, and man-made hazards in everyday and production-related activities.

#### 3.2.1 Content of health and safety education in the subject "Basics of health"

The peculiarity of the program for the school is that it was the same for all schools in Ukraine. In this way, the subject "Fundamentals of health" [5] was taught equally to all students. The last changes in the program took place in 2022. This program was supplemented by a number of war hazards. A different number of topics were added in different classes (Table 1).

 School class

 5
 6
 7
 8
 9

 Number of topics added
 The same topics as in the 6th grade are recommended
 18
 24
 33
 32

Table 1. The number of added topics by class in the "Basics of Health" (2022) subject program

In grades 5-7, the topic of war dangers contained three sections:

- Risks and dangers of wartime.
- Prevention of risks from explosive objects.
- Emergency care.

The section "Risks and dangers of wartime" contains the most topics. In the 8th and 9th grades, in addition to the above sections, the section "Psychological self-help" was added. This section is quite large. It contains 11 topics. It contains topics about: emotional reactions in acute stressful situations, traumatic stress, post-traumatic stress disorder, self-help techniques, meditation. The issue of psychological self-help is recommended for study in the 5th and following grades. In the 5th and 6th grades, one topic is devoted to the issue of psychological self-help. Psychological self-help topics are new to health and safety courses. However, psychology topics feature heavily in the Foundations of Health subject and the integrated Health, Safety and Wellbeing course. Similar topics should be used for suicide prevention. After all, according to statistics, suicide is the main cause of everyday mortality.

The program of the Basics of Health course usually consists of 4 sections (Table 2). The number and names of sections are the same for each of the school's classes. The names of units and topics in each class are different (Table 2 and Table 3).

Table 2. The structure of the program "Basics of Health" 6th grade

Section	Subsection	Number of topics in a subsection	Number of topics in a section
1. Human safety and health	Human life and health	4	27
	Environment and health	3	
	Risks and dangers	4	
	Risks and dangers of wartime	4	
	Air alarm	5	
	Emergency aid	2	
	Prevention of risks from explosive objects	5	
2. Physical	Nutrition and health	9	12
component of health	Personal Care	3	
3. Mental and spiritual components of health	Habits and health	6	19
	Self-esteem and health	3	
	Critical thinking and decision-making skills	10	
4. Social component of health	Social well-being Communication and health	7	37
	Conflicts and health	5	
	Relationships with peers	3	
	Safety in everyday life and environment. Safety in everyday life	2	
	Home fire safety	8	
	Living in an industrial zone	3	
	Cyclist safety	5	
	Behavior in extreme situations	4	
Sum	20	95	

Table 3. The structure of the program "Basics of Health" 9th grade

Section	Subsection	Number of topics in a subsection	Number of topics in a section
1. Human safety and health	Protection of life and health in wartime.	7	47
	Prevention of risks from explosive objects	7	
	Emergency first aid	7	
	Psychological self-help	11	
	Maintaining a healthy lifestyle.	4	
	A modern complex of security problems	11	
2. Physical component of health	Preservation and strengthening of the physical component of health	9	11
	Health monitoring	2	
3. Mental and spiritual components of health	Self-realization of personality	8	24
	Emotional well-being	4	
	The ability to learn	6	
	Self-education of character	6	
4. Social component of health	Social well-being Social competence.	7	18
	Reproductive health of young people	6	
	HIV/AIDS: the problem of man and the problem of humanity	5	
Sum	15	100	

The subject matter of the "Basics of Health" program covers not only safety and health issues. The program contains a significant number of environmental problems and problems that young people face

or will face in the future. The program contains not only educational but also educational content. In particular, the program has topics devoted to the formation of relationships with peers and people of the older generation. Some topics are devoted to self-education, identification of professional inclinations, etc.

The analysis of the program by all classes shows the absence of correlation with the statistics of death from external causes. The issue of suicide prevention is not included in the program. Relatively little time is devoted to traffic hazards. The amount of time allocated to the prevention of drug, alcohol and tobacco use is extremely small. Therefore, you should not expect significant efficiency from a superficial acquaintance with these topics.

The issue of disease prevention and health promotion is in the program, however, disease prevention is fragmented and does not always correspond to age characteristics. For example, in the 6th grade, issues of diabetes prevention and help with food poisoning are considered. In the 9th grade, there are no topics directly related to the prevention of diseases. Issues of motor activity, nutrition and body weight control are considered. Of course, these topics are indirectly related to the prevention of cardiovascular and other diseases.

## 3.2.2 The content of health and safety education in the integrated course "Health, safety and well-being"

The reform of the Ukrainian educational sector requires a transition from uniform all-Ukrainian programs to model ones. After the examination, the Ministry of Education and Science of Ukraine recommended several model programs for use. On the basis of these programs, teachers in schools create their own subject programs and integrated courses. The Fundamentals of Health subject is gradually being replaced by an integrated Health, Safety and Welfare course. Today there are five model programs of the integrated course "Health, safety and well-being" for grades 5-6. For grades 7-9, the Ministry of Education and Science recommended 4 model programs and a separate course "Entrepreneurship and financial literacy", which is studied in grades 8 and 9.

During the development of the program of the integrated course "Health, safety and well-being", the author's teams relied on the requirements of the State Standard of Basic Secondary Education [6]. The authors approached the implementation of the course "Health, safety and well-being" in the original form. Some of the author's collectives allocated an introduction to the program, some did not. The vast majority of author teams have divided programs into 5 sections, but there are programs with three and seven sections. This is best demonstrated in the graph (Figure 4).

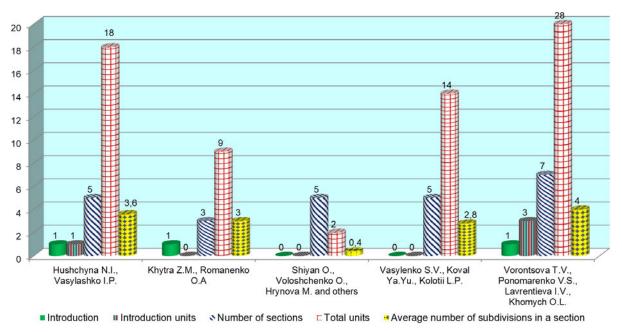


Figure 4. Comparison of the structure of model programs of the integrated course "Health, safety and well-being. 5-6 grades", 5th grade.

The new Health, Safety and Wellbeing Integrated Course syllabuses contain similar sections to the Essentials of Health syllabus. It should be noted that programs for grades 5-6 are written more original than programs for grades 7-9. Programs have kept the following sections:

- Human safety
- Human health
- Physical component of health
- Mental and spiritual components of health
- Social component of health
- Welfare [7]

Various author groups have tried to expand the number of chapters or combine them. In principle, the basic content of the model programs meets the requirements of the State Standard of Basic Secondary Education. The author's collectives made more or less emphasis on certain topics. Model programs correlate better with injury statistics. For example, in the 5th grade, different author groups recommended devoting 4 to 19 topics to the issue of transport safety. However, the programs contain only traditional safety rules and no rules for the use of electric vehicles. Electric transport has become extremely widespread in large cities. You can often meet people on electric scooters, electric bicycles, etc. Teachers will be forced to include this topic independently in the programs of a specific school. Not enough time is devoted to the study of safety in emergency situations. On the other hand, it is a consequence of statistics. Compared to other countries, Ukraine has significantly fewer natural disasters. For example, there are no volcanoes in Ukraine. Large tornadoes are quite rare. There is no threat of a tsunami. However, there are other dangers. For example, emissions of hydrogen sulfide (H<sub>2</sub>S) in the Black Sea. Insufficient attention in the programs is paid to the prevention of diseases and the formation of a healthy lifestyle.

One of the important topics is security in the virtual environment. The authors promptly responded to the appearance of these dangers. The programs include questions:

- Influence of mass media on people's health and behavior.
- Computer security.
- Dangerous risks of belonging to some online communities.
- Security of personal data in the digital environment.
- Benefits and risks of online shopping.

Given the fact that Internet technologies and artificial intelligence are rapidly spreading, computer security issues will receive more and more attention.

## 3.3 Prospects of health and safety education

Prospects for the development of safety and health education in Ukrainian schools depend on a significant number of factors. One of the key roles in this process is the example of education in the countries of Western Europe, the USA, Canada, etc. Today, the popularity of safety and health subjects is quite low in Ukraine. As a rule, they are most often given as an additional educational load for teachers of other subjects. In addition, today Ukrainian higher education institutions do not train teachers in safety and health. In some cases, this qualification is placed second to biology teachers. Therefore, the subject "Basics of health" and the integrated course "Health, safety and well-being" are taught by teachers of various specialties. Our own research has shown that biology teachers, in addition to chemistry and physics teachers, teach safety and health subjects most often. History, physical culture and other specialties. This leads to a decrease in the professional level of teaching the subject and, accordingly, to a deterioration in the acquisition of the necessary competencies by the students of education. Therefore, the prospects for the development of health and safety education will depend on the state policy in this area. In addition, the social environment and prestige of the health and safety teacher compared to teachers of other subjects will be greatly influenced. Today, most people believe that any teacher can teach these courses. That is, it is considered an "easy" course. Practice shows that the content of safety and health education is gradually becoming more complex. To fully teach the course, it is necessary to have special knowledge and knowledge of physics, chemistry, biology, psychology, medicine, disaster theory, etc. As mentioned earlier, the integrated Health, Safety and Wellbeing course additionally has a section on Wellbeing. In the 8th and 9th grades, the section "well-being" can be separated into the course "Entrepreneurship and financial literacy". In this way, the safety and health teacher turns into a safety, health and economics teacher. This is quite a complex combination. However, it is quite logical considering that the general goal of education is to improve the standard of living. It can be predicted that in the future welfare issues will be separated into a separate course.

The topic of health and safety education will depend on a number of factors. First of all, these are the statistics of deaths and injuries. The prevention of premature death, disability and injury is one of the key tasks of safety and health education. We should expect the emergence of topics related to the prevention and prevention of suicides, the expansion of the topic of traffic hazards and the prevention of harmful habits, in particular, the use of alcohol and drugs.

The increase in the number of natural disasters in the world will require knowledge about how to act during emergency situations. In some cases, such topics will have a regional accent. However, the high mobility of people will require knowledge regardless of where they live at the moment.

The key task of safety and health education is the formation of a healthy person. Therefore, the course will be expanded due to the introduction of topics on the formation of a healthy lifestyle. Important topics in this context are nutrition, physical education, hygiene, etc.

The development of information technologies has already led to the appearance of a number of new dangers. These are computer hazards and hazards associated with being in a virtual environment. This topic will be developed. Issues of virtual security will be considered during consideration of traditional issues related to society, communication, and psychology.

Some of the issues that can be included in safety and health courses relate to current hazards. The education industry quickly reacted to the emergence of military threats in Ukraine. Accordingly, the safety and health course programs were expanded to include military topics and the topic of overcoming the consequences of war hazards. Unfortunately, the consequences of the war will be felt for many years to come. Therefore, the programs of safety and health courses will remain, at a minimum, the topic of preventing risks from explosive objects and the topic of psychological help and self-help in connection with war stress.

An important issue in the development of civilization is the issue of population reproduction. Therefore, reproductive health issues are included in the health and safety education program. However, in order to form a full-fledged new generation, parents need to have a significant amount of competences. These issues are expected to be included in health and safety education. Eventually, issues related to the formation of a new generation, their safety and health can be included in a separate course. The same trend is observed today with questions about well-being, which can be studied in the subject "Entrepreneurship and financial literacy" in senior classes.

#### 4 CONCLUSIONS

It is impossible to predict all changes and trends. The general trend of the development of health and safety education will continue and will include the following topics:

- Reduction of premature mortality from ancient causes.
- Reducing the level of physical injury and disability.
- Reduction of morbidity.
- Prevention of psychological disorders.
- Improvement of standard of living.
- Socialization in society.
- Education that will include environmental and social factors.
- Extending active longevity.

Specific topics and tools of influence will change depending on the challenges that nature and society pose to man. The importance of health and safety training will increase every year. Safety and health education will be a key element in shaping a new generation of people.

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