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Scientific And Methodological Foundations For Developing Practical Fire Safety Skills In Students

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Abstract: The development of civil society, the introduction of automated systems, the construction of advanced mechanisms and multi-storey buildings and structures, as well as other factors, necessitate aligning the professional and physical preparedness of rescuers with modern requirements.

Keywords: Emergency situations, improving the physical and psychophysiological capabilities of rescuers, Academy of the Ministry of Emergency Situations, level of professional and practical preparedness.

INTRODUCTION:

Ensuring fire safety in educational institutions is one of the fundamental components of creating a secure learning environment and preparing students for potential emergency situations. Modern social development, rapid technological progress, and the growing complexity of industrial and residential infrastructures require that young specialists acquire not only theoretical knowledge but also well-developed practical competencies in fire prevention and fire response.

In many emergency situations, human readiness, physical endurance, and the ability to act quickly and accurately outweigh technological support. Therefore, forming practical fire safety skills among students is a crucial pedagogical task aimed at enhancing their awareness, responsibility, and operational capabilities. These competencies are especially essential for future specialists in fields related to emergency management, public safety, risk prevention, and technical disciplines.

Developing practical fire safety skills requires scientifically grounded methods, structured educational programs, and effective instructional technologies. These methods should integrate theoretical content with hands-on experience, simulation-based training, psychological preparation, and the formation of independent decision-making abilities under risky conditions.

The purpose of this study is to examine the scientific and methodological foundations of developing practical fire safety skills in students, identify effective instructional approaches, and propose recommendations for improving the training process in accordance with modern requirements.

1. The Role of Fire Safety Competencies in Modern Education

Fire safety Main Part

competencies represent a combination of theoretical knowledge, practical skills, and behavioral readiness that enable individuals to prevent fires and act appropriately during emergencies. In contemporary educational systems, these competencies are integral to ensuring the safety culture of students and preparing them for real-life challenges. Students with well-developed fire safety skills demonstrate: awareness of fire risks and prevention measures; the ability to operate firefighting equipment; readiness to assist others during emergencies; capacity to make rapid and correct decisions under stress; discipline and responsibility in safety-related actions.

2. Scientific Basis for Forming Practical Skills

The scientific foundations of fire safety training rely on pedagogy, psychology, physiology, and emergency management theory. The effectiveness of training depends on: systematic organization of the learning process; the integration of theory and practice; the modeling of real emergency situations; the development of physical and psychophysiological

preparedness; consistent monitoring and assessment of student performance.

Research indicates that experiential learning and simulation-based exercises significantly increase the readiness of individuals to act under hazardous conditions. Practical, scenario-based training forms more durable competencies compared to theoretical instruction alone.

Methodological Approaches to Developing Fire Safety Skills

Effective methodological approaches include: Interactive and practical training

Hands-on exercises, fire drills, evacuation training, and the use of fire extinguishing equipment enable students to internalize skills through direct experience.

Simulation technologies: virtual and physical simulation environments help model complex fire scenarios that may be difficult to reproduce in real-life training.

Modular training programs: Content divided into thematic modules (theory, equipment handling, evacuation, communication, etc.) allows for a structured and gradual formation of competencies.

Integration of psychological training: Students must learn to maintain emotional stability, overcome stress, and make decisions under time pressure.

Competency-based assessment: Evaluation based on practical performance, rather than memorized theory, ensures the true effectiveness of the training.

Development of Physical Preparedness

Physical readiness is essential in fire safety training, as firefighters and rescuers often face extreme heat, smoke, heights, and physical barriers. Training programs must include: endurance exercises; flexibility and strength training; obstacle course simulations; respiratory endurance practices.

Research shows that higher levels of physical and functional preparedness directly improve performance in emergency operations.

Improving Training Outcomes

To enhance the quality of fire safety education for students, the following measures are recommended: modernizing educational programs in line with international standards; incorporating advanced technologies and protective equipment; providing continuous professional development for instructors; strengthening collaboration with emergency services for practical training; conducting systematic diagnostics of student skills and readiness.

The scientific and technological processes covering all areas of production require constant improvement of the professional skills of rescuers and the continuous enhancement of rescue methods [1]. In many emergency situations, no advanced technology can fully replace human involvement, which creates high demands not only for special knowledge but also for the physical and psychophysiological readiness of rescuers.

Depending on the nature of the emergency, rescue operations may last from several minutes to several hours or even days. In such cases, the higher the professional and physical preparedness of a rescuer, the faster and more effectively assistance can be provided to victims. All these factors require improving the quality of physical training and enhancing the physical and psychophysiological capabilities of rescuers.

The transfer of the Fire Safety Department of the Ministry of Internal Affairs of the Republic of Uzbekistan, along with its structural and territorial bodies, to the system of the Ministry of Emergency Situations, and the termination of the activities of the state fire safety bodies, expanded the scope of professional duties of service and military personnel. The content of training future specialists for fire-rescue units at the Academy of Emergency Situations has also been qualitatively improved, necessitating revisions. Research aimed at improving the professional and physical preparedness of cadets underscores the relevance of the chosen topic of this dissertation.

Research objective: Achieving a high level of professional and physical preparedness among cadets of the Academy of the Ministry of Emergency Situations of the Republic of Uzbekistan by optimizing their academic workload.

Cadets of the Academy of the Ministry of Emergency Situations of the Republic of Uzbekistan improved their qualifications during the process of professional and physical training.

Research subject: Methods for conducting physical training and developing professional competencies among cadets of the Air Force Academy of the Republic of Uzbekistan.

Research methods: Analysis of scientific-methodical literature, pedagogical observation, survey, anthropometry, and pedagogical testing.

Scientific novelty of the research consists of the following:

— developing a method for training cadets of the Academy of Emergency Situations of the Republic of

Uzbekistan based on scientifically grounded modeling of physical exercises;

— elaborating the complex “Special Physical Training Path for Rescuers”;

— determining criteria for assessing the performance of special exercises in the “Special Physical Training Path for Rescuers”;

— identifying the degree of impact of factors hindering the movement and physical condition of cadets and modeling a set of exercises corresponding to their physical fitness level.

The experience of developed countries shows that improving the professional and personal competencies of rescuers in higher educational institutions requires the creation of favorable conditions for solving psychological and professional challenges during the training process [1,2,3,4,5]. Conducting scientific research aimed at modeling, experimentally validating, and introducing a special program for working with cadets during combat training at the Academy of Emergency Situations is of significant importance.

In developed countries, the assessment of rescuers’ physical fitness includes track-and-field disciplines (running 100 m, 1000 m, 3000 m, 5000 m), pull-ups, push-ups, as well as various swimming disciplines. According to scientific studies, although future rescuers demonstrate good physical condition, their level of professional and practical readiness remains insufficient [2]. Firefighting is one of the most dangerous professions with a high rate of injuries and fatalities [3]. In various situations, rescuers experience intense physical and emotional stress while solving professional tasks. They must be capable of making quick decisions in challenging circumstances, using firefighting equipment effectively, organizing the rescue of people and property from hazardous zones, and ensuring accurate and consistent protection of the natural environment from fires.

Cadets of the Academy of the Ministry of Emergency Situations must perform these tasks in an orderly manner. Under conditions of elevated temperature and smoke, at heights, and in difficult environments, rescuers are required to demonstrate not only strong physical health but also high moral integrity.

Professional knowledge and skills based on proper training, an adequate level of physical preparedness, and the ability to operate in emergency situations must be carried out flawlessly and accurately.

CONCLUSION

In conclusion, the first stage of the study revealed that the methodological support for the professional training of cadets at various stages of the educational process at the Academy of the Ministry of Emergency Situations of the Republic of Uzbekistan is insufficient. An analysis of scientific literature shows that improving working capacity can be achieved through special physical training that encompasses a wide range of professional tasks.

According to the results of the study, the level of physical preparedness and functional condition of the cadets at the Academy of the Ministry of Emergency Situations of the Republic of Uzbekistan was found to be low based on indicators of physical qualities, which increases the likelihood of deteriorating mental and physical conditions and the occurrence of various occupational injuries. During the initial experiment, mandatory training was conducted using the special exercises of the “Special Fitness Corridor for Rescuers.”

It was determined that the most effective approach is a gradual increase in training load intensity. To address this issue, a methodology of physical training was developed and tested. In this methodology, special equipment accounted for 30% of the total training time. At the beginning of the physical exercises, the heart rate could range from 120–129 beats per minute, later rising to 135–145 beats.

With the gradual increase of load intensity and the expanded use of special exercises in the “Special Fitness Pathway for Rescuers,” it became possible to significantly improve not only the level of physical qualities but also the overall physical performance indicators of all participants. The physical preparedness indicators of the experimental group improved statistically significantly in all control exercises. The highest growth was observed in flexibility—69.6% and 170.3%—as well as in strength, which increased by 69%. These results demonstrate the high effectiveness of the recommended method.

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