

*Original Research Article*

# Disaster Medicine in the Medical University Program - Objective and Challenges

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Abstract

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**Medical University, Plovdiv consists of four faculties and one Medical College. The medical activities performed in order to protect the citizens' life and health in case of natural and man-made disasters were part of students' educational programs from the University foundation in 1945. The medical science development and the recorded increase in disasters frequency and severity, as well as the public expectations, in last decades have had significant impact on Disaster Medicine teaching. The aim of this publication is to present the objective and challenges of Disaster Medicine education in Medical University, Plovdiv. By the means of descriptive method, the objectives of the established Disaster Medicine program in the Medical University, Plovdiv are described. Comparative method was applied in order to analyze how the theoretical and practical exercises during students' education respond to Disasters' Medical Management and Support. As a result of performed analyses the advantages of established educational program, as well as the ways for its improvement are presented.**

**Keywords:** Disaster medical management and support, Disaster medicine training, Educational Program, Medical University, Plovdiv

## INTRODUCTION

Medical support to the population in case of calamities became part of the tutorial academic program from the establishment of the facility for medical education in Plovdiv as a medical faculty of the Plovdiv University in 1945. During the years, a lot of changes have been inserted into this program in order to correspond with the scientific development, the novels into hazards' identification process, to represent the current national system for population support in case of disasters and crises, to name just a few. All changes in the structure of the teaching process, of the topics presented during the lectures and discussed and trained during the academic seminars have been induced by the populations' increased expectations for medical support during and after calamities.

In the last decade, the disaster medicine teaching challenges have become more complex and more demanding. They are related mainly to the following:

- Recorded increase in disasters frequency and severity

- The medical science development;
- Public expectations;
- Ongoing healthcare and society reforms.

Nowadays the community concern on life and health protection during natural and man-made disasters is becoming greater and greater because of the recorded change in disasters' frequency and consequences (The International Disasters Database // <http://www.emdat.be/disaster-trends>). Only in the last twelve years as consequences of natural and man-made disasters 1.1 million people were killed, 2.7 billion people were affected and the damages are exceeding 1.3 trillion US dollars ([http://www.preventionweb.net/files/25833\\_20120318disaster20002011v2.pdf](http://www.preventionweb.net/files/25833_20120318disaster20002011v2.pdf)). What is more with the population growth in the last decades the communities density is in constant increase, thus elevating the number of the population at risk in case of disastrous event or major incident. The consequences of the disasters are more severe not only because of the constantly increasing

population at risk, but also because of the magnitude and scope of the disasters damaging factors – the world witnessed four out of the ten most devastating earthquakes regarding lives lost and five out of the ten most devastating earthquakes regarding affected population and estimated economic damages costs only during last ten years (The International Disasters Database). While analyzing the man-made disasters, the results are quite the same – five out of the ten most devastating industrial disasters regarding estimated economic damages costs have happened in the last decade (The International Disasters Database).

Medical science is among the most rapidly developing ones in the last fifty years. All the breakthroughs in sciences have been providing a constant impetus to the medical art progress and diagnostic and treatment capabilities broadening and improvement. Disaster medicine organization, training and education have to implement the best medical practices and algorithms because when disaster strikes there will be no time, means and capabilities for practice or treatment algorithm refinement – the time is of utmost importance for life saving and health preservation, therefore all procedures have to be trained and refined prior to the event.

The Media broadcastings capabilities, capacities and means (from “old fashioned” radio broadcasting to the social networks) nowadays are transforming the information management and exchange in the real power. There are no boundaries into information sharing, therefore, the medical specialists have to be ready to work not only in one hostile, life threatening environment, where they have to save lives fighting with the time and paucity of resources, but also under Media microscopic analyses of all their activities, when not all the reports are focused on the real challenges but also on the possibility for fast glorious reportage based on shortfalls and deficiencies emphasis.

Last but not least as important challenge Disaster Medicine tutorial process has to overcome is related to the ongoing and never-ending process of disaster relief and medical support structures reforms. Constantly, sometimes even twice a year, the legislative and organizational bases are changed, reformed, improved.

The aim of this publication is to present the objective and challenges of Disaster Medicine education in Medical University, Plovdiv.

## **MATERIALS AND METHODS**

By the means of descriptive method, the objectives of the established Disaster Medicine program in Medical University, Plovdiv are described. Comparative method was applied in order to analyze how the theoretical and practical exercises during students' education respond to Disasters' Medical Management and Support.

## **RESULTS AND DISCUSSION**

The Plovdiv Medical University was established in 1945 as a Medical Faculty to the Plovdiv University. During the past near seven decades' history, this prestigious educational and scientific center has been transformed several times – being part of the Medical Academy Sofia, enlarged with additional faculties and Medical College, to finally become Medical University with four Faculties – of Medicine, Dentistry, Pharmacy and Public Health, Department of Language and Specialized Training and Medical College. More than 700 teachers with high competence, of which over 200 with PhDs are engaged in the tutorial and training process of average 4,200 students from all levels of medical education (Kostianev, 2013).

The significance of medical students' education and training on procedures, interactions and activities to be performed in case of natural or/and man-made calamities was recognized and the medical-sanitary protection has been inserted into students' tutorial program from the establishment of the Medical Faculty. Till 90-s the tutorial program was more focused on Chemical, Biological, Radiological and Nuclear (CBRN) protection of medical facilities, medical teams and field installations and population in general. Students were trained in using collective and personal protective equipment, were educated on how to train the population in first and buddy aid provision, on the triage, war surgery and field therapy. Due to the “Cold War” environment great part of the tutorial process was dedicated to the Chemical and Nuclear weapons impact on single human life and health, as well as their impact on public health and society as a whole. Students were presented with an extended toxicological and radiobiological course of lectures and practice. With the change in the geo-political situation new threats to the society wellbeing are noted. The terrorism is becoming a concern to every country, especially to the countries that, as a Bulgaria, are located in the geographical and cultural crossroads. The recorded trend for increase in the frequency and severity of the disasters in the last decades focused public attention on governmental readiness to respond to the calamities' challenges in order to save lives and decrease the human suffering. Nowadays the increased population expectations from medical community in case of disaster along with the revolutionary development in all sciences and technologies are demanding for a constant update of the medical specialist preparedness and training, especially in the fields where the time is critical and resources are scarce, as it is in the Disaster Medical Support.

The Medical University, Plovdiv is responding to these challenges by annual review of the Disaster Medicine program and by including the Disaster Medicine as a mandatory discipline in all Faculties and Medical College (Kostadinov, 2010). What is more in the Public Health Faculty at its post-graduate Bachelors and Masters programs include a course of Disaster Medicine.

The objectives of the Disaster Medicine are to provide medical specialists with knowledge about:

- Natural and manmade disasters – origin, causes, occurrence, features, development, impact on a single human and on population health;
- Mass casualty events;
- Required medical activities in case of Disaster – coordination and collaboration;
- Standard Medical Operating Procedures in case of Disasters;
- Scope of medical activities, treatment and rehabilitation of the injured in case of Disasters;
- Practical training of health providers for reaction and performance in case of disasters.

To fulfill these tasks, specific to the audience – students in Medicine or students in the Medical College, students in Dental Medicine or medical specialist in the Master of public health and health management - programs are developed and constantly reviewed. Generally, the Disaster Medicine program consists of four modules with different depth of the knowledge presented, according to the future place of the medical specialists in the Unified Rescue System, established in the Republic of Bulgaria. The four modules are as follows:

- Disasters and Disaster Medicine - Disasters – definitions, Disaster Medicine – objective, tasks, principles features, classifications, medical aspects, terminology;
- Disasters' Medical Management and Support Objectives, tasks, principles, organization, planning and execution; First Aid, First Medical Aid; Medical activities on the field;
- Radiology and Radioecology - Definitions, hazards, impact on human and society health, acute and chronic radiation syndrome;
- Chemical and Biological Area of Damage - Toxicology - Main toxic hazards/chemical weapons – features, health impact, medical assistance; Biological hazards – features, consequences, medical management, sanitary control.

Depending on the student audience these four modules are taught from 45 academic hours (15 hours lectures and 30 hours practice – theoretical and practical exercises) for the students in the Medical faculty to 30 academic hours in the Medical College.

Regardless the audience a written test is evaluating the students' knowledge acquired during every module. The final exam consists of test and oral/written exam.

Notwithstanding the long history of the Sanitary Medical Protection/Disaster Medicine tutorial process in the Medical University of Plovdiv, there are challenges that the academic team has to face and respond to. Generally speaking, the challenges could be divided into two big groups:

general ones – (related to the disasters' characteristics and changes in the society) and tutorial related ones. Some of the main general challenges are listed:

- Disasters complexity – changed frequency and severity, population at risk, new disastrous events, growth in the terrorism threat etc;
- Ongoing legal, organizational and structural changes in Disasters Management (Kostadinov, 2010), closely related to the constant changes in the healthcare system, the financial system durability, the governmental priorities etc.
- Social changes leading to changed attitude to disaster preparedness and every single society member possibility to train and educate himself;
- Changes in the Healthcare System – directly affecting the organization of Disaster Medical Support education, training, planning and execution, to name just a few.

The most important of the tutorial related challenges are:

- Students' grade – Disaster Medicine is taught on third academic year. This is causing difficulties both in the tutorial and learning process – it is difficult to discuss with students in their first clinical experience steps how to differentiate the specific for chemical or biological injuries symptoms or how to treat patients with combined damage, when the students are not familiar even with the diseases symptoms and diagnostic process;
- Medical science development – the development in some of the fields of the medicine could benefit the Disaster Medicine preparedness and to increase the life-saving capability of the medical teams, but time and a lot of funds are required to implement the latest diagnostic-treatment achievements;
- Medical specialization – in the last decade most of the physicians are looking to specialize into medical specialties that are more lucrative and wanted on market, thus leaving a significant gap of polyvalent specialists as general surgeons, internal medicine and emergency medicine that are required in the medical support to the disaster affected population;
- Computer based exercises vs. live exercises – the capacities of computer simulation are becoming an obstacle in the tutorial process, because the computer simulated exercises are cheaper, faster and therefore welcome in the training process, but the encounter with the reality, especially in disaster affected region (field exercise with makeup patients and a scenery close to the real one) is more beneficial for the students;
- Tutorial staff management – unfortunately the Disaster Medicine is not one of the most wanted medical specialties, therefore is becoming more difficult to recruit Disaster Medicine specialist for the academic development.

Discussing the results from the performed analyses an emphasis on comprehensive approach to both groups' challenges is considered as most appropriate. In general, the academic community hardly could direct the changes in the legislative, structural or organizational aspects of healthcare system's development that are mostly political and economic driven. The Disaster medical support management as a part of the national healthcare system

is also framed by the financial and political restrictions. On the other hand, the academic society could influence the political will by provision of well-justified and timely given proposals and solutions. Regarding the pure tutorial challenges the academic capacities are far more capable for drawing and implementing appropriate solutions. By preparing and executing a joint life exercise with the centers for emergency medical aid, Medical University students, the municipality representatives and companies could provide the decision makers with undisputable proves about the need of changes in the Disaster Medical Support Management tutorial and training processes. Another example for comprehensive approach is to perform a survey regarding the acquired theoretical knowledge and practical skills among medical students and professionals in order to reveal the actual disaster medical preparedness of those who are expected to provide the medical support to the population and to compare them with the ones of general population polling groups.

## CONCLUSION

Based on the results of the performed analyses and discussion the author notes that Disaster Medicine is an integral part of Bulgarian medical specialists' education, but the disasters' complexity and medical science development require the implementation of a new

approach in the student tuition, as well as in the medical specialist postgraduate specialization in order to respond to the increased population expectation and to the change in the disasters features.

## REFERENCES

- Kostadinov Rostislav. Major Incident Management and Support Bulgarian Policy. // Public Health and Health Care in Greece and Bulgaria. Editors Jeliasko Hristov, John Kyriopoulos, Theodori Konstantinidis, Elena Shipkovenska. Papazissis Publishers, 2010, pp. 691-696
- Kostadinov Rostislav. Medical Teams' Theoretical Preparation for Major Incident Medical Support. // Public Health and Health Care in Greece and Bulgaria. Editors Jeliasko Hristov, John Kyriopoulos, Theodoris Konstantinidis, Elena Shipkovenska. Papazissis Publishers, 2010, pp. 223-229
- Kostianev S. // <http://meduniversity-plovdiv.bg/en/> (accessed on 25 May 2013)
- The International Disasters Database // <http://www.emdat.be/disaster-trends>  
[http://www.preventionweb.net/files/25833\\_20120318disaster20002011v2.pdf](http://www.preventionweb.net/files/25833_20120318disaster20002011v2.pdf)
- The International Disasters Database [http://www.emdat.be/result-disaster-profiles?disgroup=natural&period=1900%242013&dis\\_type=Earthquake+%28seismic+activity%29&Submit=Display+Disaster+Profile](http://www.emdat.be/result-disaster-profiles?disgroup=natural&period=1900%242013&dis_type=Earthquake+%28seismic+activity%29&Submit=Display+Disaster+Profile)
- The International Disasters Database // [http://www.emdat.be/result-disaster-profiles?disgroup=tech&period=1900%242013&dis\\_type=Industrial+Accident&Submit=Display+Disaster+Profile](http://www.emdat.be/result-disaster-profiles?disgroup=tech&period=1900%242013&dis_type=Industrial+Accident&Submit=Display+Disaster+Profile)