

## Special Article: Disaster Medicine

# Attitudes of Lazarski University Medical Students towards Disaster Medicine; Questionnaire Survey

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## Abstract

**Background:** The paper presents issues related to the deficit in medical student training in the field of disaster medicine. According to Polish medical educational standards, there is no obligation imposed by the legislator to educate future doctors in disaster medicine. However, there is the university's authorial capacity, which, as exemplified by Lazarski University in Warsaw, has been successfully implemented for teaching students disaster medicine and has demonstrated effectiveness in education in this field.

**Methods:** The study was conducted by means of a diagnostic survey method, using an authorial survey questionnaire. A total of 168 medical students between 2020 and 2022 took part in the survey. The questionnaire contained 10 questions, one- and multiple-choice ones, of which one was about self-assessment. Students completed the questionnaire twice, before and after the disaster medicine course.

**Conclusion:** The results clearly indicate the need for educational standards for issues related to disaster medicine, especially for faculties of medicine, where future doctors will be trained to deal with large numbers of casualties. Students manifest the need for such courses during their studies and as part of postgraduate training.

**Keywords:** Disaster medicine; Crisis management; Medicine; Medical education; Multiple and mass casualty incidents

**Abbreviations:** CBRN: Chemical, Biological, Radiological and Nuclear Defence; JumpSTART: Pediatric Triage; KSRG: National Firefighting and Rescue System (NFRS); State Fire Service: in Poland PSP; START: Simple Triage and Rapid Treatment; TCCC: Tactical Combat Casualty Care; TRIAGE (Fr.): Segregation, Sorting.

## Introduction

Disaster medicine is, unfortunately, poorly rooted in the general public's awareness, including other areas of the art of healing. Meanwhile, it is difficult to imagine that emergency medical systems could be based on emergency medicine alone. Disaster medicine, a relatively young science, as it has been present in its present form for more than thirty years, is a full-fledged and irreplaceable component of any professionally developed emergency medical system [1]. Considering the problematic na-

ture of disaster medicine, one should quote the words of an unknown author, who stated that wars are won not by the number of soldiers, but by the number of paramedics [2]. However, this maxim should certainly not be taken merely as a clever story, but as far-reaching wisdom. The number, effectiveness and efficiency of rescuing entities determines whether we will be able to survive any disasters that occur, whether we will be able to minimize the number of victims of a disaster, a terrorist attack or an armed conflict should one occur. Crisis response and di-

saster medicine are therefore an important discipline, which in Poland has its place among firefighters, soldiers or territorial defense forces.

Unfortunately, following new trends in the development of emergency medicine, it can be seen that although teaching at medical universities in Poland focuses on emergency medicine, disaster medicine is not given enough theoretical and practical courses. Most studies have focused on external disasters and the preparation of medical, nursing, public health or emergency medical personnel. There should be a greater emphasis on educating the personnel of the health care area, i.e. all health care professionals and support staff, about national as well as international disasters. A detailed analysis of disasters that have already taken place allows us to verify, correct and optimize existing response schemes and disaster management. On their basis, we can also create evaluation tools to improve actions and speed up their initiation in case of adverse events [3].

### Education

In Poland, medical education is determined by the Regulation of the Minister of Science and Higher Education of 26 July 2019 on standards of education preparing to practice the profession of doctor, dentist, pharmacist, nurse, midwife, laboratory diagnostician, physiotherapist and paramedic [4]. Annex No. 1 to the Regulation sets out the standard of education preparing to practice as a doctor provided in medical studies, which are uniform master's programmes and last 12 semesters. The number of teaching hours, including placement, must not be less than 5700. However, there is no mention of taking any courses in disaster medicine. This seems completely incomprehensible, especially in view of such a high quality of medical education. The same regulation with regard to training in emergency medicine, as part of a 3-year bachelor's degree programme, in Annex 8 already stipulates compulsory lectures on the types of terrorist threats, the principles of countering terrorist and bioterrorist attacks, as well as the legal conditions of crisis management. In contrast to medical training, future paramedics are also required to acquire knowledge and skills in the types of disasters, medical procedures and rescue operations undertaken in multiple and mass casualty incidents and disasters, as well as in incidents with chemical, biological, radiation or nuclear hazards. The content also includes ethical aspects of rescue operations in multiple and mass casualty incidents and disasters [4] and mass events and disasters [4].

### Solution to the Problem

Lazarski University in Warsaw has introduced compulsory courses in emergency medicine in the 1st year of study, which introduces students to disaster medicine. A 30-hour optional course in disaster medicine has also been created for the 4th year. As part of the course, students learn about the management of multiple and mass casualty incidents, the principles of medical segregation as well as the principles of cooperation between rescue entities, communication and the evacuation and transfer of injured persons. The current armed conflict in Ukraine fully justifies the need for such courses, a view shared by medical students. Given global climate change, countries all over the world could be affected by a disaster they have not yet had to face, which directly translates into a lack of experience in dealing with its consequences. Valuable experience and knowledge of disaster management, gained from those that have already occurred, should be used for future prevention and management, not only in the disaster region itself, but also

worldwide. Medical education in disaster prevention and management worldwide is essential. The time has come when it becomes indispensable to integrate disaster management with medical education. Given the importance of medical staff collaboration in disaster management, an interprofessional education approach to education is also justified [5]. Luca Ragazzoni et al. described in their paper the results of an online survey distributed to all students registered in the national association of medical students (Segretariato Italiano Studenti Medicina). The author is a member of the International Federation of Medical Students' Associations. The survey consisted of 14 questions divided into four sections. From its results, it was concluded that of the 639 medical students surveyed, 38.7% had never heard of disaster medicine; 90.9% had never attended optional academic courses in disaster medicine; 87.6% had never taken non-academic courses in disaster medicine; 91.4% would welcome the introduction of a disaster medicine course into their core curriculum; and 94.1% felt that knowledge of disaster medicine was important for their future career [6].

### Methods

A total of 168 medical students responded to the survey. The questionnaire survey was conducted between 2020 and 2022, and participation in the survey was voluntary. The survey contained 10 questions about disaster medicine, including one self-assessment question. It aimed to determine the need and legitimacy of teaching in this area. Females were the predominant group among the students surveyed (102 respondents), accounting for 60.71% of the respondents. The average age of the respondents was 22 years. The questionnaire was completed twice, before and after the disaster medicine course. The self-assessment of the students was very important for the analysis of the results.

### Results

The analysis of the survey results allowed a comprehensive approach to the problem and the needs generated by disaster medicine. In question 1, respondents were asked to specify their knowledge of disaster medicine. All respondents completed this part, where 0 meant no knowledge at all and 5 meant very good knowledge. As many as 87.5% (147 respondents) revealed that their knowledge in this area was insufficient, where they marked the item 0. The remaining respondents described their level of knowledge as poor and very poor. In question 2, students were asked to answer whether they could define the term disaster medicine and identify the key points that the discipline deals with. There were 99 respondents who identified it as being related to disasters, 17 who linked it to military action and the remainder who considered it to be a field that deals with incidents with large numbers of injured people, regardless of the cause. No one was able to give a definition explicitly. Several answers could be selected for this question. Question 3 dealt with the concept of a mass casualty incident. Students were asked to identify what was key to the definition and recognition of an event as a mass casualty incident. Unfortunately, a small number of people correctly identified that the outcome of primary segregation and the selection of persons allocated to the red priority was crucial, resulting in the need for medical emergency response and medical emergency response implemented immediately exceeding the capacity of forces and resources. Unfortunately, a small number of people correctly identified that the outcome of primary segregation and the selection of persons assigned to the red priority group, as a result of which the need for medical emergency action and medical emergency ac-

tivities carried out with immediate effect exceeds the capacity of the forces and resources of the rescuers present on the scene in a given phase of the emergency operation. Twenty-seven people answered this question correctly, representing 16.07% of all respondents. Question 4 related to the knowledge of casualty segregation systems. Students were asked to describe the segregation systems they were familiar with. Nine of the respondents described the START system, while the others wrote 'don't know', 'have no idea', 'don't know' or gave no answer. In question 5, respondents were asked to name the system used in the army and special police units, Border Guards and other units of a similar nature that may conduct their operations on the battlefield as well as under fire. Only 3 (1.78%) indicated TCCC as the correct answer, which literally means tactical-combat casualty care. Question 6 related to the segregation of casualties in chemical, biological, radiation and nuclear events, i.e. CBRN hazards. Assistance at the scene of such an incident requires cooperation and coordination of many services. The acronym DISASTER (detection, incident management system, checking, analysis, forces and resources, TRIAGE, evacuation, recovery) can be used to facilitate and remember the actions to be performed at the scene of an accident. Not a single person marked this acronym as the correct answer.

In Poland, the leading formation in specialized rescue service is the National Fire Service, which is the organiser of the National Firefighting and Rescue System. Question 7 concerned the knowledge of the principles of organisation of the National

Firefighting and Rescue System and identification of the leading institution. A total of 119 respondents indicated correctly that the State Fire Service (PSP) is the organizer of the National Firefighting and Rescue System, 28 indicated the Polish Army, and the remainder indicated the crisis management formation located in voivode ship governor's offices, which there are 16 in Poland. Question 8 asked respondents to indicate which incidents with a large number of people would be marked as the highest priority (red), and the incident itself would be considered mass. Respondents were given a choice of issues such as shin fracture, impaired consciousness, traumatic thumb amputation and failure to breathe after airway clearance. The largest number of responses (134) indicated no breathing after airway clearance. Unfortunately, only 17 (10.11%) indicated impaired consciousness as the highest priority. Question 9 asked about the legitimacy of having knowledge in selected emergency situations. Respondents were asked to indicate situations that they thought would require knowledge of medical operations, along with elements of disaster medicine. Several answers could be given. All respondents (100%) indicated armed conflict, natural disaster, and traffic incidents with large numbers of casualties. Question 10 dealt with the student's identification of the need for a disaster medicine class and increase of their knowledge in this area. When asked whether disaster medicine should be a separate and compulsory subject, 157 respondents answered affirmatively, 2 respondents were in favour of optional courses, the remainder indicated the answer: "difficult to say". No one indicated a negative answer. After the activity, the students

**Table 1:** Comparative results of questionnaires before (1) and after (2) a disaster medicine course (N=168).

Question number	Questionnaire 1	Questionnaire 2
1	0 – 147 1 – 6 2 – 15 3 – 0 4 – 0 5 – 0	0 – 0 1 – 0 2 – 0 3 – 0 4 – 9 5 – 157
2	Disaster – 99 Military action – 17 Incidents with a large number of casualties - 52 Correct definition - 0	Disaster – 168 Military action – 168 Incidents with a large number of casualties –168 Correct definition - 168
3	Correct answer - 27	Correct answer - 168
4	START – 9 JumpSTART - 0	START – 168 JumpSTART - 168
5	Correct answer TCCC - 3	Correct answer TCCC - 168
6	DISASTER - 0	DISASTER - 168
7	PSP – 119 Polish Army - 28 Voivode crisis management - 21	PSP – 168 Polish Army - 0 Voivode crisis management - 0
8	shin fracture - 10 impaired consciousness - 17 traumatic amputation of the thumb - 7 lack of breathing after airway clearance- 134	shin fracture – 0 impaired consciousness – 168 traumatic amputation of the thumb – 0 lack of breathing after airway clearance - 0
9	armed conflict - 168 natural disaster - 168 traffic incidents with a large number of injured people- 168	armed conflict – 168 natural disaster – 168 traffic incidents with a large number of injured people- 168
10	Yes – 157 Optional course – 2 Difficult to say – 9 No - 0	Yes – 166 Optional course – 2 Difficult to say – 0 No - 0

START: Simple Triage and Rapid Treatment; JumpSTART: Pediatric Triage; TRIAGE: Simple Triage and Rapid Treatment; TCCC: Tactical Combat Casualty Care; PSP: State Fire Service.

were subjected to a secondary evaluation, which consisted of answering identical questions as before the activity. (Table 1) shows a comparison of the two surveys. From the analysis of the questionnaires, it can be clearly deduced that there is a clearly noticeable progress in terms of knowledge, which, in the results presented, undoubtedly indicates good learning outcomes and the need for them.

### Discussion

The aim of disaster medicine education is to impart and popularize knowledge of the principles of rescue operations in mass accidents and disasters and principles of providing assistance to casualties at the scene of an incident. Another objective is to prepare students to plan rescue operations and risk assessment in mass casualty incidents and cooperation with other services, as well as to develop an attitude of concern for and responsibility for the health and lives of the injured of mass incidents. Issam Barrimah et al. in their study indicated that medical students' knowledge of natural disasters was low, with an average score of 1.65 out of 5 points. Male students showed significantly higher average scores in some areas of disaster medicine. The students supported the idea that a training course is needed, giving a mean score of 3.66/5, and agreed with the statement that disaster medicine training should also be provided to the general public (mean score of 3.85/5) [7]. When analyzing other education systems in the context of teaching disaster medicine, we can look at Germany. Disaster medicine has been part of German medical education since 2003. However, research there has shown some inconsistencies in the implementation of the national curriculum and limitations in the number of students educated over the years. More recently, the SARS-CoV-2 pandemic and other disasters have drawn attention to the importance of coordinated training of medical students in disaster medicine [8]. The medical student communities, in their surveys, clearly indicate the need for topics related to disaster medicine, and clearly separate this subject from emergency medicine [9].

At the undergraduate medical school level, we distinguish between civilian and military training. The available literature allows us to compare the preparation of students at these universities in disaster medicine. In their study, Luc J M Mortelmans et al. showed that military university students scored higher in terms of knowledge and skills in disaster medicine, however only 27% of them were students in their senior years. The education and military training of these students makes them better prepared for disaster situations than their civilian counterparts [10]. The knowledge of future medical graduates is vital in their workplaces. The preparation of hospitals is mainly based on the medical staff's knowledge of the issue, as well as appropriate assumptions made in the event of a disaster. All hospital emergency departments should include not only adults but also children in their disaster plans and drills. Emergency department staff should be knowledgeable about their role in disaster-related strategic institutions and familiar with standards in crisis management [11]. Incidents of all kinds with large numbers of casualties can affect us at any time and claim many lives. As doctors, paramedics and nursing staff working in hospitals are on the front line of the disaster or crisis response system, they are the first responders, right after pre-hospital emergency response for disaster victims. As demonstrated by Tassew, Sheganew Fetene et al. more than half of the medical personnel who were participants in the study had poor knowledge, negative attitudes and inadequate practice in disaster or

emergency preparedness. [12]. Lack of curricula is the main reason for the lack of knowledge of health professionals about this issue. Therefore, education in the above-mentioned area must be included in the curricula of all medical universities and in the continuing medical education programmes of health care providers. Long-term formal training, such as undergraduate, graduate and postgraduate courses, is essential. Operational simulations involving key services and rescue formations, focusing on organizational training rather than individual training [13]. Analyzing work experience, very interesting findings were presented in their paper by Heather K Hayanga et al. They surveyed a representative sample of 175 anesthetists and 95 residents. A small number of respondents reported that they had received sufficient education and training in disaster medicine and public health. Providing education and training can help create a more efficient and effective staff of disaster response professionals [14]. With the methodology of postgraduate education in mind, it is important to point out that identifying incentives for participation in trainings in disaster preparedness can help hospitals and other healthcare providers create targeted training and educational materials to better prepare all medical staff for future disasters [15]. Educating future physicians as the highest medical authority is essential, especially if a large number of casualties are involved. The physician's decision is crucial, and they will only be able to make that decision if they have an adequate body of knowledge in disaster medicine. James C. Reedy et al. outlined the role of the nurse as a disaster medicine leader. He pointed out that there is a lack of evidence in the literature on the preparation of nurses as emergency and disaster leaders. His research clearly identified significant gaps in confidence in nurses being leaders in a variety of roles and in structured education that prepares leaders from among nurses across the spectrum of experience to deal with crisis situations. It showed that leaders lack consistent education that prepares them to manage crisis situations and disasters. Nurse leaders at all levels would benefit from formal education in these areas [16]. It should be noted that, in most cases, doctors are the ones who supervise wards or manage hospitals. In view of this, it is also their responsibility to prepare subordinate medical staff for disaster response. Managers can create activities that will enable nurses to learn about their concerns regarding disaster preparedness. The relationship between self-assessment and competence in disaster preparedness remains unclear, although there is strong support for competence in nursing practice to ensure safe patient care [17]. Although education and training initiatives for disaster management (ETI) currently exist, they are not widely available in all EU countries. A study by Pier Luigi Ingrassia et al. identified the need for the development of a standardized, competency-based education and training curricula for all European countries to ensure practice and policy that meets both standards of care and wider expectations for the professionalization of medical personnel in disaster and crisis situations [18].

### Conclusions

Based on the analysis of the results of the questionnaire survey and the review of available scientific publications, one of the main conclusions is that there is no compulsory training of medical students in disaster medicine. There is also a lack of educational standards for this subject. There is a real need to create conditions for medical students to learn about the rules applicable during disasters and multiple and mass casualty incidents. Another emerging conclusion is the need to practice the cooperation of medical personnel with rescue services and enti-

ties, to learn the principles of communication, coordination and command during such operations. There is a need for further research into disaster medicine education, its evaluation and the skilful implementation of these issues during under- and postgraduate training.

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