

OUTCOME-BASED EDUCATION OF MEDICAL RESCUE WORKERS IN POLAND ON THE EXAMPLE OF WARSAW MEDICAL UNIVERSITY – RECOMMENDATIONS FOR IMPROVEMENT OF EDUCATION PROGRAMMES

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Abstract

According to the guidelines of European and National Qualification Frameworks and the Polish reform of the higher education system resulting from these guidelines, university-level schools gained greater autonomy with respect to creating new majors and developing curricula.

The aim of the study was to present the evaluation of the outcomes-based curricula for medical rescue students in Poland on the example of an education programme used at Warsaw Medical University.

In the European Union, medical rescue is not a regulated major; therefore, in accordance with the guidelines of European and National Qualification Frameworks, each university-level school offering a course for medical rescue workers has the autonomy to develop their own outcomes-based curricula.

The course in Medical Rescue at the Faculty of Health Science, Warsaw Medical University, is a Bachelor's degree programme (vocational course) that lasts 3 years, i.e. 6 semesters and students participate in a minimum of 3800 class hours, including a minimum of 320 hours of professional training.

Appendix no. 4 to Resolution no. 77/2012 of the Warsaw Medical University Senate of September, 24th, 2012 regulates the outcomes of education in the major of Medical Rescue at WMU. In accordance with the guidelines, these effects relate to the following three areas: knowledge, skills, and social competence.

A general education programme for medical rescue workers comprises the areas of medical science, health science, and science of physical culture and maintains its highly practical profile. Education aims to train specialists ready to initiate their own activities that shall keep them healthy and protect against illness. Warsaw Medical University implemented the curricula, providing a full integration of knowledge comprising biological, technological, social, and organisational and legal conditioning so that the competence of graduates allowed for comprehensive cooperation at every level of the healthcare system in Poland. University education involves both laboratory classes and learning classes as well as classes conducted in simulation laboratories equipped with specialist devices for practical classes on medical emergency treatment and a large block of classes on physical culture. A special emphasis is put on an ability to comprehensively integrate knowledge and skills in order to make the most accurate diagnosis or find the best way to solve health problems of a particular person or larger populations as well as to solve healthcare management problems.

Due to the fact that outcomes-based curricula for medical rescue students were introduced at Warsaw Medical University only in the academic year 2012/2013, the quality of teaching in this major according to new education programmes needs to be constantly monitored.

Keywords: medical rescue, quality of teaching, knowledge, skills, social competence.

1 EDUCATION OF MEDICAL RESCUE WORKERS IN POLAND

The implementation of the State Medical Rescue Act of 2006 commenced a new profession - a Bachelor in medical rescue. Polish higher education institutions were supposed to introduce specialised training for prospective medical rescue workers. Framework curriculum, rules of organisation and the mode of study were developed. Teaching standards regulating the basic rules of organisation of specialised higher education were successively introduced, producing education outcomes at this particular major.

With the establishment of a new professional group, medical higher education in Poland faced significant challenges, e.g. the organisation of the process of university education for medical rescue workers. The training process should be conducted in the form of vocational higher education offered mainly at medical universities or other vocational higher schools. Therefore, university education is responsible for training highly qualified medical personnel. The evolution process concerning regulations for education of this particular profession faces the lack of uniform, superior guidelines for organisation of higher education. A minimal number of legal resources and the developmental dynamics of this discipline do not allow for continuous and coherent integration of assumptions. By the time the State Medical Rescue Act became effective, graduation from a 2-year post-secondary school that conducted teaching on the basis of a curriculum that was far from the actual professional demands had been the only way to be awarded a degree in medical rescue. The Higher Education Act of July 27th, 2005 and the Regulation of the Minister of Research and Higher Education of July 12th, 2007 on educational standards for particular programmes of study and levels of study as well as the procedures for creating new study programmes and conditions to be met by the medical university in order to run interdisciplinary studies and combination majors regulate the issue of specialised training conducted by university-level schools. The minimum number of teaching hours at the first cycle degree programme was established at 3800, including 320 hours of practical classes. Therefore, members of this professional group are supposed to be employed in medical emergency teams, as ambulance dispatchers and co-ordinators of emergency operations as well as supreme first aid trainers in the Polish healthcare system. The teaching model, nature of internship and the scope of medical entitlements were based on Anglo-American standards and modeled after the Emergency Medical Service units. Western standards put the emphasis on the development of competencies in advanced life support [1].

Previous training based on post-secondary curricula did not meet the criteria for the selection of knowledge that are binding in the western models and, most importantly, did not meet the assumptions developed under the State Medical Rescue Act. Thus, an urgent need arose to adjust the tools used to fulfil the assumptions of the State Medical Rescue system to the profession. The year 2004 was a breakthrough since the Ministry of Health initiated works on a uniform and comprehensive curriculum for medical rescue workers that was supposed to be taught only at vocational Bachelor's degree programmes [1]. The new profession was supposed to be more self-reliant in professional activity. Owing to this, a medical rescue worker should face excessive requirements from the very beginning. The nature of this profession involves a high possibility of extraordinary and stressful situations that are mentally and physically demanding [2]. The curriculum has to include substantial preparation to perform emergency medical activities in community units and participate in clinical activities and procedures of emergency medicine. [3]

Organisational adjustment of the process of education has to be compliant with the European Credit Transfer System (ECTS). This allows for the recognition of diplomas abroad and for transfer of academics, curricular and institutional assumptions within the exchange of resources all over the European Union.

Acquiring all the necessary subject-matter knowledge of the basic clinical disciplines was regarded as the top priority in education of medical rescue workers, allowing for independent undertaking of advanced life support. The course of studies comprises six semesters with a minimum of 12-week internship in the last year of studies, 40 hours a week [5]. Time proportion was set for particular thematic blocks. The first stage of education (first three semesters) is focused on modules in fundamental sciences. Next, training comprises interdisciplinary blocks of clinical courses where theoretical knowledge acquired earlier finds its practical application. Furthermore, supporting and additional courses are conducted throughout the entire training, evenly distributed in terms of the number of hours [5].

Apart from that, the introduction of the major in medical rescue constitutes a progressive challenge for a structural organisation of higher education institutions. In compliance with the newly introduced law, emergency medicine departments were supposed to be established at universities in order to supervise education at this major. What is more, clinical departments were still responsible for teaching all other courses, which led to even greater overwork of the staff in teaching hospitals.

Because of unspecific nature of medical events, it was also necessary to introduce teaching cooperation between different services of Polish medical rescue system. The Guidelines for the Organization of Emergency Medical Services of the National Emergency and Fire System (NEFS) implemented on the 5th of July, 2004 allowed for commencement of a multidimensional cooperation between the units of the State Medical Rescue, State Fire Service, and police. Being an element of

NEFS allows medical rescue students to participate in the two-tier standardization of learning conducted during the block of courses in the Main School of Fire Service, constituting one of the modules of specialised training.

2 OUTCOMES OF EDUCATION FOR THE MAJOR IN MEDICAL RESCUE

The Description of General Education Outcomes for the major in medical rescue is the most recent source of legislative acts for specialised training of medical rescue workers. The process of educational evaluation during the course of studies takes place in the form of teaching areas divided into three categories: knowledge, skills, and social competencies. At the level of these three variants it is possible to very precisely refer to the practical knowledge that each medical rescue student is supposed to acquire. Such a division makes it impossible to forget to implement the necessary outcomes of education [6].

Table 1 Education outcomes for the major in medical rescue and table of references to the outcomes of education for the major in medical rescue, first-cycle degree programme, practical profile of field education outcomes.

DESCRIPTION OF GENERAL EDUCATION OUTCOMES after graduation from BA programme in MEDICAL RESCUE
knows the human body structures: cells, tissues, organs, and systems
knows and understands metabolic processes at the level of cells, organs, and entire body
knows ethical and legal determinants of the profession of a medical rescue worker
knows psychological basis of behaviour and relations with family, close surrounding, and society
understands problems resulting from disabilities, invalidity, and chronic diseases
understands social determinants of health and illness
knows the legal aspects concerned with the procedures for dealing with persons with mental disorders
knows the structural disorders in cells, tissues, organs, and entire system caused by a disease or trauma
knows and understands the mechanisms leading to sudden health- and life-threatening situations
knows the symptoms and signs and the course of clinical conditions, as well as the methods for management in particular clinical conditions
knows the general mechanisms of action of drugs
knows the methods of pain relief
knows the principles of decontamination
knows the types, symptoms and signs, and results of weapons of mass destruction (radiation, chemical and biological contamination)
knows the procedures in multiple and mass events and in disasters
knows the rules of health promotion, proper nutrition, and healthy lifestyle
knows the risk factors for health and life
knows the mechanisms inducing symptoms and effects of stress

knows the foundations of epidemiology and and disease prevention
understands the structure and organisation of healthcare system at the national and global level, including economic determinants
knows the procedures in rescuing drowning persons and the basics of climbing protection
knows the organisation, functioning, and funding of the State Medical Rescue system and the organisation and functioning of other services and organizations providing rescue
knows the rules of establishing and conducting business activity specialising in medical rescue
knows the basics of and terminology used in health sciences to the extent necessary for the major in medical rescue
knows the procedures of central vein catheterization and accessing central veins
knows the aseptic and antiseptic techniques
knows the procedure of calling the Polish Medical Air Rescue (PMAR)
knows the procedures of taking off and landing of PMAR units
knows the rules of communication with PMAR
is able to effectively communicate with the patient, his/her family (carer), or a witness
is able to take a history from the patient, his/her family, or a witness
is able to explain to the patient the nature of his/her complaint and justify the decision concerning further treatment
is able to effectively communicate with team members and other healthcare professionals
is competent in communicating and cooperating with other services and organisations providing rescue
is able to recognise medical emergency
knows the procedures adequate to a particular medical emergency
communicates with persons with disabilities (with multiple disabilities in particular)
uses alternative and supportive communication techniques at the scene of an event
is able to evaluate the condition of the patient to determine further actions
is able to evaluate the patient's state of consciousness
knows how to place the patient in the position appropriate to his/her medical condition or injury
is able to perform basic resuscitation procedures in adults and children
is able to perform advanced resuscitation procedures in adults and children
is able to restore airway patency using no equipment
is competent in restoring airway patency with equipment using supralaryngeal methods
is competent in performing endotracheal intubation in direct laryngoscopy
is able to perform coniotomy and cricothyrotomy

is able to perform oxygenation
is competent in supporting breathing
is able to perform ventilation using a manual resuscitator or transport ventilator
is able to monitor respiratory function with pulse oximetry and capnometry/capnography
is able to perform an electrocardiogram and recognize a life-threatening ECG trace
is able to perform electrical defibrillation using a manual and automated defibrillator
is able to perform cardioversion and external electric stimulation of the heart
is able to monitor the function of the cardiovascular system using non-invasive techniques
is able to assess neurological condition of the patient, including the use of grading scales
is competent in establishing peripheral intravenous access
is able to establish intramedullary access
is competent in administration of drugs and fluids
is able to take blood samples
is able to collect samples for toxicological testing
is able to monitor critical parameters, including glucose levels using a glucometer, electrolytes, capillary blood gases
is able to introduce a nasogastric tube
is able to catheterize urinary bladder
is competent in dressing wounds
is competent in arresting external haemorrhage
is competent in performing post-injury immobilization of the extremities
is competent in performing stabilization and immobilization of the spine
is able to introduce appropriate procedures in the case of life-threatening pneumothorax
is competent in using injury severity scales
is able to handle emergency delivery outside the hospital
is able to perform triage
is able to recognize the signs of death
is able to recognize the exposure to noxious factors at the scene of an event
is able to decide not to perform resuscitation
is able to perform protective actions in order to reduce health consequences of an event
is able to work in a team
is able to work in a team when providing aid in difficult terrain conditions during the day and at night and in mentally and physically demanding conditions

is able to cooperate with representatives of different healthcare professions
is able to prepare the patient for transportation and provide him/her with care
is able to manage a medical record
knows a foreign language at B2 level
is competent in using computer and other means of communication
keeps fit
is able to rescue drowning persons
is able to use the basics of climbing protection
is able to apply means of direct coercion in a person with mental disorders
is able to teach the basics of the first aid
is able to perform an ABC examination correctly
is able to use computer databases of scientific literature
is able to correctly assess practical significance of and interpret study results presented in the literature that are valid for emergency medicine
is able to prepare and perform a training
is able to design and prepare an educational presentation
is able to perform central vein catheterization
is able to access central veins correctly
is able to apply aseptic and antiseptic techniques
is able to use hand rescue signals for PMAR teams during taking off and landing
is able to keep safety measures near a helicopter
is able to call PMAR under the right conditions
is aware of his/her own limitations
is capable to act in stressful and uncertain situations
is able to take care of his/her own security and of security of partners
is able to manage his/her own time and time of his partners effectively
has a habit of and skills for continuous improvement
is aware of the importance of professional behaviour and following the code of professional conduct
is aware of the responsibility for the tasks performed together as a team
put the patient's good first
treat patients with respect and understanding for his/her ideological and cultural differences
keep fit enough to be able to practise the profession
respect the rights of patients

3 UNIVERSITY EDUCATION OF MEDICAL RESCUE WORKERS OFFERED AT WARSAW MEDICAL UNIVERSITY

The analysis of organisation of education in medical rescue at Warsaw Medical University was performed through a preliminary verification of meeting the requirements imposed by the legal acts specifying limitation criteria for major studies. The further stage of this analysis involved a development of a detailed description of forms of teaching used for particular courses. The present study highlights the most important issues covered during particular courses that strongly influence the process of acquiring professional skills. A teaching guidebook developed for this major constituted the basis for the analysis. The study was supplemented by the assumptions for development of teaching included in the protocols of the Programme Boards made in the years 2011-2013. This was conducted in compliance with the development strategy aiming to improve the quality of teaching that was introduced at Warsaw Medical University.

3.1 General education courses

University education of medical rescue workers at Warsaw Medical University is conducted in compliance with the binding legislative acts regulating the organisation of medical vocational education. Evolution of the current norms referred to the development of the major and continuous evaluation of education. Warsaw Medical University has met all the necessary regulations in all areas, multiplying the minimum number of teaching hours by several times in order to improve the quality of teaching of prospective medical professionals.

Education outcomes imposed by legislative acts were the basis for developing the schedule and thematic fields necessary to be covered during the course of studies. The blocks of courses were divided into thematic fields with a minimum number of teaching hours for particular courses. In compliance with the curricular assumptions for the major, each course was assigned to a certain block of courses and a fixed number of teaching hours is supposed to be conducted during each year of studies. Courses conducted at the major in medical rescue at Warsaw Medical University are arranged with respect to a year of studies, not always referring to a particular item in the core curriculum. This, however, is not an evidence of the lack of synergy with the core curriculum; it is an alternative organisation of the courses that allows for the adjustment of the form to the requirements, which increases the educational abundance in core areas of education of future medical rescue workers.

Teaching in general disciplines comprises 360 teaching hours divided between the courses. Biochemistry and biophysics courses are conducted in accordance with the assumption consisting in the introduction to the basic chemical and physics terminology with selected issues of biochemistry and biophysics and all that aims to teach the foundations of functioning of living organisms and the matter. Teaching is enriched with specialist literature that allows for broadening the field knowledge necessary to pass the course.

Each student is obliged to obey the rules of the regulations that includes class attendance and alternative forms of making up an excused absence. Class attendance requires active participation which can be awarded with extra points. Credits are granted on the basis of passing a test, which consists in the sum of points obtained on seminars and final exam.

These courses are arranged for the first two semesters, evenly divided between them. At Warsaw Medical University, the emphasis on practical aspect of these courses is placed on the first semester. Organisation of teaching physical education constitutes a separate module whose comprehensiveness at the major in medical rescue is above average. This course is precisely profiled so that it comprises a wide variety of physical activities that can be of use for a medical rescue worker. The main task for this course is to prepare conditions promoting the improvement of motor skills and fitness. This takes place in accordance with students' abilities. The course is also supposed to broaden knowledge of physical culture and particular issues concerning the physiology of physical exertion and motor sports rehabilitation.

3.2 Major courses for emergency medicine at the major in medical rescue at WMU

The process of education is multidimensional and well-organised in particular courses that are adjusted with their content to the year of studies. Owing to the above, after passing the "First Aid - BLS" course, students participate in the training in emergency medicine - Integrated Emergency

Management. At this course, students learn about the structure and principles governing the State Medical Rescue system. Students are taught the principles of cooperation with other emergency rescue units providing qualified first aid. This also constitutes an introduction to a thematic block organised with cooperation with the only higher school for fire services in Poland i.e. the Main School of Fire Service. Specialist Rescue in Emergency Medicine is one of the fundamental courses taught to medical rescue students. At this course, students learn the principles governing the National Emergency and Fire System and the nature of rescue and firefighting operations. Safety rules that are essential at the scene of an event are also comprehensively trained, with an emphasis put on the effective cooperation between emergency services.

4 RECOMMENDATIONS FOR IMPROVEMENT OF CURRICULA FOR MEDICAL RESCUE WORKERS

The essence of the emergency medical knowledge is presented during the "Emergency Medical Activities - Advanced Life Support" course. The course comprises 60 teaching hours of classes. It is the essence of practical learning of the assessment of and performance in medical emergencies, which constitutes the area of operation for medical rescue workers. In order to integrate knowledge necessary for performing medical procedures, this course expands the knowledge acquired during the first year of studies at the following courses: First Aid - Basic Life Support, Qualified First Aid, and Emergency Medical Activities which are focused on teaching anatomy and physiology. It is this very course that provides medical rescue students with the first opportunity to perform basic medical procedures that constitute the most rudimentary emergency operations performed on a daily basis while practising as a paramedic. This is of great importance, since this course has always been highly assessed when compared to other specialised courses at the major in medical rescue. In the third year, this course is continued in the form of the "Emergency Medical Activities - Techniques of Medical Procedures" course with a practical exam at the end. Students broaden their knowledge of recognizing and introducing procedure protocols in life-threatening conditions. Students also learn how to use life-saving equipment. Clinical classes give an opportunity to perform the basic diagnostic and therapeutic procedures. As well as it is in the case of discipline based teaching in the first year, the educational abundance can be seen in the number of teaching hours, amounting to 94, including 60 teaching hours of classes and two obligatory duties.

Practical experience is gained first at the ALS course, and in the next year of studies it is extended during the "Traumatology of the Musculoskeletal System - Advanced Trauma Life Support" course. This course comprises learning theoretical and practical procedures for trauma patients, which are a part of emergency medical activities, i.e. the core procedures performed by medical rescue workers. During the "Traumatology of the Musculoskeletal System" course students receive theoretical introduction to ATLS, i.e. they become familiar with the basic procedures for rescue operations at the scene of an event, principles of transportation of casualties, and the most common injuries to the musculoskeletal system.

Coherent university education of emergency medicine and practical training constitutes a unique advantage of the organisation of university education of medical rescue workers at Warsaw Medical University. This is connected with the leading educational role of the Division of Emergency Medicine which is the main educator in this field during the entire cycle of studies. This also allows for the maintenance of harmony of the process of education, expressed mainly in the organisation of education in the form of particular courses in the course of studies.

Teaching the Sign Language at Warsaw Medical University is almost a unique issue. This special language course gives an opportunity to learn to communicate with persons with impaired hearing. The curriculum is adjusted so that it allows for learning 500 ideographs and dactylography. Owing to this, future medical rescue workers shall be able to overcome fear of contact with deaf persons and use sign language to take a medical history from an injured deaf person. Curricular flexibility can also be seen in teaching IT which constitutes a separate course. This makes prospective medical rescue workers capable of using Internet to verify medical information or develop clinical algorithms used in emergency medicine. Information technologies are also used in statistical inference.

Becoming familiar with the above mentioned assumptions allows for an insight in a variety of fields whose organisation of teaching medical rescue workers at Warsaw Medical University is unique in the country. They may constitute recommendations for national guidelines for the improvement of curricula. The evaluation of the system of education at WMU demonstrated that the initial steps taken to improve the quality of teaching were effective.

The organisation of the major in medical rescue at Warsaw Medical University is unique in Poland with reference to teaching methods such as training camps with the Water Voluntary Rescue Service (WOPR) and Mountain Volunteer Search and Rescue (GOPR) as well as teaching Sign Language, among others. Warsaw Medical University continues to search for new possibilities of improving the university education of medical rescue workers, e.g. by means of dialogue in the form of Programme Board meetings. The introduction of a three-stage diploma exam at Warsaw Medical University guarantees a detailed confrontation between the knowledge and skills and suitability to practise the profession.

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