

Doctoral degree in health professions: Professional needs and legal requirement*

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Received: 17 December 2012

Accepted: 2 April 2013

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To respond to ever increasing complexity of health care professions, education of nurses, midwives, physiotherapists, radiology engineers, and medical laboratory workers, has been upgraded to pregraduate, graduate and postgraduate university levels. In Croatia, nursing was defined as a branch of clinical medical science in 1997. Croatia and Bosnia and Herzegovina have introduced first two levels, but there is a strong need for the third one (doctoral degree). It should last three years and contain 180 ECTS points. It includes acquisition of evidence-based advanced health care, and the ability for independent research and critical analysis. Doctoral degrees in health professions are instrumental for academic careers of faculty of health professions. Yet this will not separate them from their patients or make them administrators, as the majority of their work will still be spent alongside patients.

Key words: Education, Nursing, Postgraduate, Nurses, Health occupations.

Introduction

The last fifty years have seen dramatic changes in all aspects of biomedical science, including the health sciences: nursing, midwifery, radiologic technology, physiotherapy, and medical laboratory diagnostics. The importance of better education for all healthcare professionals has increased in order to address the increasing complexity of health care due to aging population, chronic disease management, numerous new technologies and expensive procedures,

It is generally accepted that the minimum level of education required for nursing practice and other health professions, is a bachelor's degree (1, 2). Formerly, most common nursing skills were very simple and few in number, such as: setting bed, changing patient position, cleaning of patient room and furniture and use of enema. Today, the description of nursing competencies and skills include many complex skills such as clinical reasoning, use of evidence-based practice, interdisciplinary collaboration and team-

*Translated by permission from Croatian version Marušić M, Mimica M, Mihanović F, Janković S. Doktorat iz zdravstvenih znanosti: stručne potrebe i zakonske zadanosti. *Medix*. 2012;18(103):169-74.

work, health promotion, participation in chronic disease management - for instance educating patients with diabetes, chronic obstructive pulmonary disease etc., and care for terminally ill patients, with complex skills like an open heart massage during cardiac surgery (3).

In physiotherapy, radiologic technology and medical laboratory diagnostics, as in nursing, complex skills development is very marked, and in some areas it is even more prominent.

The World Health Organization (WHO) has for decades included nurses and other health professionals (midwives, physical therapists, radiologic technologists, sanitary engineers) in the process of promoting and protecting health (4).

According to the instructions of the European Union, countries with no qualified nurses for teaching in the field of nursing may employ teachers from other countries (5).

University education for health professions: Three cycles

Outcome of Bologna process is the convergence of higher education in the European Union, which will facilitate mobility and employment opportunities, including those in regulated professions – nurses and midwives. Since the Republic of Croatia enters the European Union on 1 July 2013 it is necessary to harmonize nursing education with dominant European trends (6, 7). Understanding and acceptance of this need has resulted in establishment of university health studies. University studies enable system of continuing education, knowledge updating and adoption of the latest findings, as well as continuous monitoring and identification of health needs priorities in the state and the European environment. Education and practice are closely related and strongly influence each other (8).

In its basic principles The Bologna Declaration (9) emphasizes strengthening the

transition between university studies. The Sorbonne Declaration (10) recommends that studies should be organized in two successive cycles - undergraduate and graduate master's or doctoral level programmes. Subsequent discussions led to Berlin document (11) which introduced so-called European model, with three basic education university degrees: undergraduate, graduate and postgraduate; this has created the European Higher Education Area, 2010, based on three educational cycles bachelor-master-doctor.

Undergraduate or baccalaureate degree

The first cycle (undergraduate study) is focused on basic education. According to the instructions of the World Health Organization (12) the training of nurses and other health-care workers must be at university level. The goal of the first cycle of education is to equip nurses with the necessary skills for becoming autonomous practitioners. It comprises three-years of study with workload of 180 ECTS credits, after which the professional title of Bachelor is acquired.

Nurses responsible for general healthcare (care)

Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications defined training programme for nurses responsible for general care (13). Admission to training for nurses responsible for general care requires completion of ten-year general education.

Education of nurses responsible for general care comprises at least three years of study or 4600 hours of theoretical and clinical training, the duration of the theoretical training representing at least one third and the duration of the clinical training at least one half of the minimum duration of the training. Training is given on a full time basis and includes the programme of theo-

retical and clinical (practical) training. By graduation, students should acquire the following knowledge and skills:

- a) Adequate knowledge of the sciences on which general nursing is based, including sufficient understanding of the structure, physiological functions and behaviour of healthy and sick persons, and of the relationship between the state of health and the physical and social environment of the human being;
- b) Sufficient knowledge of the nature and ethics of the profession and of the general principles of health and nursing;
- c) Adequate clinical experience; such experience, which should be selected for its training value, should be gained under the supervision of qualified nursing staff and in places where the number of qualified staff and equipment are appropriate for the nursing care of the patient;
- d) The ability to participate in the practical training of health personnel and experience of working with such personnel;
- e) Experience of working with members of other professions in the health sector.

Midwives

Training for midwives should guarantee the acquisition of the following knowledge and skills:

- a) Adequate knowledge of the sciences on which the activities of midwives are based, particularly obstetrics and gynaecology;
- b) Adequate knowledge of the ethics of the profession and the professional legislation;
- c) Detailed knowledge of biological functions, anatomy and physiology in the field of obstetrics and neonatology, and also a knowledge of the relationship between the state of health and the physical and social environment of the human being, and of his behaviour;
- d) Adequate clinical experience gained in approved institutions under the super-

vision of trained staff qualified in midwifery and obstetric;

- e) Adequate understanding of the training of health personnel and experience of working with such (13).

University programme in radiologic technology

The rapid development of radiology in the world prompted by development of radiologic devices and radiologic technology has led to the need for opening new studies in the field of radiologic technology. In the USA in 2005 the Joint Review Committee on Education in Radiologic Technology's (JRCERT) demanded that the directors and lecturers at the radiologic technology and imaging methods study complete the Master's degree level of education by 2009 (14). This requirement has led to the opening of several study programmes at universities in the USA, and among the first to recognize the need and develop a programme was Thomas Jefferson University in Philadelphia. The program is based on 3 + 2 model of study. A three-year baccalaureate degree completion is required to enrol in graduate university study programmes (15). Midwestern State University (MSU) has also introduced a master's (Engl. Master of Science) programme in radiologic technology (16). In most countries in Europe the studies in the field of radiologic technology are based on the Bologna Declaration stipulating the 3 + 2 model. University of Bradford in England provides Master's degree study programme in radiologic imaging studies (17), while a few European universities established inter-university Master's degree programme in the field of radiological imaging methods in 2009 (18).

University programme in physiotherapy

Development of physical therapy profession in Europe and the world is marked by a sig-

nificant increase in the range of knowledge and skills and therefore the programmes are adapted to the present needs of profession and the current needs of modern health care. The World Confederation for Physical Therapy devoted a special thematic conference to postgraduate and continuing education of physiotherapists in the European region (19). The programme is compliant with the European standards in physical therapy (20), and post-graduate training programmes in physical therapy as well (21).

European educational strategy considers undergraduate, graduate and post-graduate training (first, second and third cycle of education according to the Bologna process) to be a key prerequisite for successful work of physiotherapist as a professional.

Curricula in Split and Mostar are made and customized to curricula of the School of Physiotherapy and Performance Science University College Dublin, Queen Margaret University College Edinburgh and Faculty of Physiotherapy Wroclaw. There is a doctoral degree programme in physical therapy at the University of Wroclaw (22).

University programme in medical laboratory diagnostics

Medical Laboratory Diagnostics is a health and scientific field related to medical laboratories of various specialties and profiles in health care institutions and institutions that are not within health care system but are associated with the laboratory diagnostics. The rapid development of science and application of new technologies in the field of laboratory biomedicine requires constant professional and scientific education. Applying new knowledge is made possible only by an expert who is in touch with recent scientific advances, with competencies and skills based on them, harmonized with professional priorities and comparable to programmes at respectable universities in the

European Union countries (Norway, Austria, and Slovenia). According to the principles of the Bologna declaration a bachelor should adopt basic practical and theoretical knowledge of the profession, work successfully in a team and perform less complex tasks independently (9).

Graduate or master degree programmes

According to current European views (23) graduate master degree programme represents further step in university education after completion of undergraduate study of nursing or other health professions (3 years, 180 ECTS credits). Admission to graduate programme requires completion of undergraduate studies at a recognized higher education institution. Educational goals for graduate two-year master's programme, with a total of 120 credits, are training students for teamwork, planning processes, projects, decision-making, acquiring leadership skills, with process assessment, as well as additional specialist skills and knowledge in chosen fields. Besides these skills, students at graduate level are trained for teaching and new training methods as well.

Postgraduate or doctoral studies

The third cycle, doctoral degree is organized for health professionals who intend to pursue academic career in health studies. It lasts three years and has 180 ECTS credits. It includes studying advanced evidence-based practice, with acquisition of skills for independent research that encourages abstract thinking and critical analysis, with understanding and adapting scientific knowledge. It is achieved by using analytical and conceptual skills, leading to improvement of the theoretical foundations of nursing practice and health care and application of research into practice by using scientific methods in

research and teaching (24, 25). The result of establishing postgraduate studies will be acquiring a degree that provides health professionals with academic certificates whose value is equal to the certificates of their colleagues at other universities upon completing post-doctoral studies (26).

Doctoral degree in health sciences is necessary for academic career of teachers at health studies. Namely, that health studies must have a qualified teaching staff and highly educated nurses, midwives, physical therapists, radiologic technologists and other health professions.

Teachers of health care should meet following requirements:

- Have master's and doctoral degree,
- Their teaching is based on research,
- Are qualified for teaching,
- Have at least 2 years of teaching experience in their field.

Postgraduate study is organized primarily with aim of enriching their own scientific potential by creating teachers trained at the highest academic level. The curriculum of postgraduate study is multidisciplinary, which allows mastering the methodology of scientific research and provides a competitive knowledge, skills and abilities in the field of nursing, physical therapy, radiologic technology, midwifery and medical laboratory diagnostics (27).

Graduate and postgraduate studies will not separate nurses, midwives, radiologic technologists and physiotherapists from patients and they will not become administrative officers; they will continue to perform most of their work with patients in health care institutions.

Croatian rule on the establishment of scientific fields

In Croatia, nursing as a branch of science was introduced in 1997, in the area of biomedicine and health science, the field of

clinical medical sciences (28), while in Europe, according to "Field of Science and Technology (FOS) Classification in the Frascati Manual", nursing as a branch of science is found in the area of Medical and Health Sciences, the field of Health Sciences (29). By 2011 in Croatia higher education in nursing and most of other health professions was not possible at the university level, which is a prerequisite for continuing higher education at the postgraduate university level. Establishment of postgraduate studies in the field of Health Science is a logical continuation of higher education of health professionals in order to create conditions for development of branches in Health Sciences and obtaining a doctoral degree, and ensuring scientific and academic staff in the field of Health Sciences.

General characteristics of doctoral studies in health professions

Curricula comprise compulsory courses (60 ECTS), elective courses (60 ECTS) and doctoral thesis work (60 ECTS). Elective courses are organized into modules related to individual health professions (e.g., nursing, midwifery, physiotherapy, radiologic technology, medical laboratory diagnostics, etc.). The model should be applied to all three levels of education.

The goals of the doctoral degree programme

The most important goals of the doctoral programme are to prepare students for clinical research, for participation in college work and pursuing teaching career at university, along with ability to create modern innovative concepts and approaches aimed at improving the quality of life of individuals, organizations and society (30-34).

The study takes a minimum of three academic years (6 semesters), ending with final examination after completion of all courses,

and preparing and defending a doctoral dissertation in the maximum period of seven years. After the thesis is defended students are awarded the title of Doctor of Health Sciences (30-32).

The main goals of doctoral study programme "Health Sciences" are (32-34):

- c) Provide a critical understanding of the theoretical and methodological concepts
- d) Enable students to pursue independent, interdisciplinary research,
- e) Generate new and relevant knowledge by verifying existing and creating new solutions,
- f) Develop critical thinking based on evidence-based research,
- g) Involve international organizations in research and quality control studies.

The most important objectives of the doctoral programme "Health Sciences" are to enable students to pursue clinical research, to participate in teaching and creating modern innovative concepts, approaches and attitudes. Scientific work should be focused on health science and changing health practices (8).

Competences acquired during studies

Wider and relatively general list of competencies (32-35) would include:

- a) Contribution to the health profession through independent scientific research and creation of new knowledge,
- b) Identifying, analysing and solving problems by finding, understanding, and evaluating evidence-based information,
- c) Planning and conducting original scientific research in the field of health studies, using the results of evidence-based practice in a format suitable for publication in international journals,
- d) Understanding, evaluation and application of modern analytical methods in research, with continuous improvement in health care and acceptance (adoption)

of attitudes in response to the constant changes in health care and more complex types of health care,

- e) Ability to identify and promote ethical and legal principles in conducting research,
- f) Theoretical, methodological, analytical and critical approach by testing scientific discoveries in health practice, through debates, conference presentations, and research workshops,
- g) Evaluating clinical practice through scientific research,
- h) Using research results in clinical decision making
- i) Continuous clinical judgment, evaluation and self-evaluation aiming at ensuring quality and excellence,
- j) Communicating by different techniques of informing, educating, motivating and improving the quality of life of healthy individuals, patients, families and larger populations,
- k) Establishing a respectful relationship with patients, their families and colleagues,
- l) Participating in interdisciplinary research teams and their management,
- m) Promoting health in vulnerable and multicultural populations,
- n) Understanding "philosophy" of medical science.

Jobs the students are trained for

Jobs of a health professional with doctoral degree include:

- a) Academic researcher with emphasis on evidence-based research, along with teaching younger colleagues,
- b) Jobs in practice with high-quality patient care;
- c) Conducting research in healthcare systems (organizations);
- d) Management positions in health care institutions and systems.

Curriculum

Postgraduate degree programme “Health Sciences” (third cycle) shall be organized and conducted according to the curriculum, lasting at least three years (six semesters). Since 60 ECTS represent the workload of one academic year, a three-year programme is worth 180 ECTS credits.

- a) Structured courses (mandatory and optional),
- b) Work with a mentor and thesis writing,
- c) Mandatory and optional extracurricular activities.

Students

We believe that number of enrolled students should be relatively small, so that teachers can be committed to them as much as possible within a given program, especially in the individual work, so that most of them actually get a doctoral degree. It needs emphasizing because the number of PhD candidates has never exceeded 20% and most often it is less than 10%. 704 participants were enrolled in postgraduate studies in the field of biomedicine and health care in the academic year 2010-2011 while 10 PhD candidates submitted doctoral dissertation in the same academic year (35).

Mastery of the English language should be mandatory condition of enrolment since it is universal language of science and no teaching can make a scientist from a person that does not master English well. Students should be determined to carry out the part of their education abroad and in English language.

Knowledge of English is required at a level enabling oral and written communication, following scientific and teaching materials and use of computer programs. Students' working places must have potential, opportunity and support so that they are able to conduct research on which they will base

their doctoral dissertation. Students should not cover the costs of studying abroad themselves (36). Moreover, small, objective, informed and fair board will, when the time comes, assess how much the institution can help students financially to complete their dissertation. On the other hand, students must pay the full amount of tuition fee for each new academic year, until they defend dissertation. After defending thesis, a college should pay back half of tuition for the first three years of study.

Doctoral dissertation

Based on the Guidelines for organization of doctoral programs in biomedicine and health studies (37), reached by consensus, a doctoral dissertation should be equivalent to at least three *in extenso* papers published in internationally indexed peer-reviewed journals. They must display independent intellectual contribution of bachelor (for example, a PhD candidate should be the first author). According to the Guidelines courses should occupy no more than 20% of the candidates' workload.

Special features of doctoral studies in health professions

Today there is virtually no teacher of health professions in Bosnia and Herzegovina and Croatia at the Assistant professor level - a person who has an MA and PhD degree and has relevant scientific publications. Actually this is about a decisive interruption of the “vicious circle” of falling behind the world: unless we have teachers, we cannot have universities, and unless we have schools (including doctoral studies), we cannot have teachers. So far students of health studies who have completed university graduate study due to various reasons, on average lag behind the students of medicine and dental medicine in scientific education, and

this should be borne in mind when organizing postgraduate studies for them. Postgraduate courses in health professions should rest on three basic principles:

- a) Focus on research and developing a doctoral dissertation, formal ex cathedra teaching should be reduced to a minimum. This principle applies to postgraduate courses of all other professions as well.
- b) Teaching should be tailored to the individual needs; therefore, it should be flexible, individualized, relying on elective courses and courses held outside home colleges and universities, and always aiming directly at developing each individual doctoral dissertation.
- c) All forms of learning should be based on principles and techniques of evidence-based medicine.

Teachers should be selected according to their expertise, flexibility and commitment to adapting to the individual needs of students. Therefore most of the classes should be delivered in tutorials, directly or via electronic media. For all these reasons the first task of the institution which considers launching doctoral studies in health science is to choose three teams: 1) a team for making rational decision to start doctoral stud-

ies, 2) an operational team for implementing the decision, and 3) a team for objective and careful monitoring the implementation of the decision.

Conclusion

Establishment of postgraduate studies in the field of health science is the achievement of modern Europe and the developed world. It is a logical continuation of higher education for health professionals because it creates conditions for development of branches in health sciences and obtaining a doctorate which would ensure scientific and academic staff in the field of health sciences. These doctoral studies should a) focus on research and developing a doctoral dissertation and formal ex cathedra teaching should be reduced to a minimum b) teaching should be tailored to the individual needs and therefore should be flexible and individualized, relying on elective courses and courses outside home colleges and universities as well, and c) all forms of learning should be based on principles and techniques of evidence-based medicine.

Conflict of interest: The authors declare that they have no conflict of interest.

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