

Comparative Analysis of Family Medicine Education and Exams at Cathedras of Family Medicine of Universities in Southeastern Europe - “Splitska inicijativa”, Sarajevo, 2017

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ABSTRACT

Education means: learning, teaching or the process of acquiring skills or behavior modification through various exercises. Traditionally, medical education meant the oral, practical and more passive transferring of knowledge and skills from the educators to students and health professionals. Today the importance of focus on educational quality, particularly in the professions operating in the services required by people is agreed by all involved. The higher educational system shoulders some critical responsibilities in the economic, social, cultural and educational development and growth in the communities. In countries that are in transition it is in charge of educating professional human workforce in every field and if the education is optimal in terms of quality, it is capable of carrying out its responsibilities. It is reason why there is the necessity behind discovering some strategies to uplift the quality of education, especially at university level.. By increasing the courses and establishing universities and higher education centers, the countries around the world have generated more opportunities for learning, especially using modern information technologies. Regarding to evaluating different educational services quality, one of the most important measures should be the way to develop programs to promote quality and also due to the shortage of resources, evaluating the services quality enables the management to allocate the limited financial resources for realization whole educational process. Advances in medicine in recent decades are in significant correlation with the advances in the new models and concepts of medical education supported by information technologies. Modern information technologies have enabled faster, more reliable and comprehensive data collection. These technologies have started to create a large number of irrelevant information, which represents a limiting factor and a real growing gap, between the medical knowledge on one hand, and the ability of students and physicians to follow its growth on the other. Furthermore, in our environment, the term technology is generally reserved for its technical component. This terminology essentially means not only the purchase of the computer and related equipment, but also the technological foresight and technological progress, which are defined as specific combination of fundamental scientific, research and development work that gives a concrete result. The quality of the teaching-learning process at the universities in former Yugoslav countries and abroad, depends mainly of infrastructure that includes an optimal teaching space, personnel and equipment, in accordance with existing standards and norms at the cantonal or entity level, which are required to implement adequately the educational curriculum for students from first to sixth year by Bologna studying concept. For all of this it is necessary to ensure adequate funding. Technologies (medical and information, including communications) have a special role and value in ensuring the quality of medical education at universities and their organizational units (faculties). “Splitska inicijativa” project, which started 6 years ago as simple intention to exchange experiences of application new model of education, based on Bologna studying concept, and other types of under and postgraduate education, was good idea to improve also theory and practice of it within Family medicine as academic and scientific discipline. This year scope of our scientific meeting held in Sarajevo on 24th and 25th March 2017, was quality assessment of theoretical and practical education and, also, evaluation of knowledge by students exams (a-y).

Keywords: family medicine, education, knowledge evaluation, quality assessment.

Quality Assessment of Medical Education at Faculty of Medicine of Sarajevo University

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ABSTRACT

Introduction: The quality of the teaching-learning process at the universities in Bosnia and Herzegovina and abroad depends mainly of infrastructure that includes an optimal teaching space, personnel and equipment, in accordance with existing standards and norms (1-4). For the assessment of teaching at the faculties it is very important opinion of students (1, 2). Students are often unhappy with the educational process. **Goal:** To compare the results of the teaching process evaluation between students studying according to the Bologna system and the old system of education. **Material and methods:** We used the questionnaire as a carrier of data created with variables relevant for assessing the success of the educational process at the Medical Faculty in Sarajevo. The survey was conducted among students of the sixth year of the Medical Faculty in Sarajevo, through four generation of medical students. **Results and discussion:** Based upon a survey of students, measuring their satisfaction with the educational process realized (theoretical and practical instruction, interactive learning, testing, use of IT and technical aids in teaching, availability of instructional literature for preparing for the exam, etc.), we came to the conclusion that the worst evaluated are those factors that depend on financial resources that are available, which is specifically related to library fund of the Medical faculty and the degree of computerization of educational process, and also the level of training of teachers to convey knowledge to students with the application of modern medical information technology and technical teaching aids. About 61% of students of the Bologna process is considered that they are ready to engage in independent work, while 45% of students of the old system had the same opinion (three generation, 2012-2014, 365 students). About 61% of students in 2014/15 generation and 65% of students in 2015/16 generation (students of the Bologna process) is considered that they are ready to engage in independent work (2). **Conclusion:** Primarily due to the insufficient quality of facilities, and later due to lack of possibilities for additional training of staff and students, the Bologna

system never came to the maximum point of implementation at the Faculty of Medicine, University of Sarajevo, what the facts about the readiness for independent practice demonstrate. Kaizen, the Japanese philosophy about the way of life, promoted that the pursuit of continuous improvement must be applied at all levels of the organization of the teaching process, from the students to the management, and it is essentially the only way to improve the educational system, not only in the Faculty of Medicine, but also in the entire University (2, 5, 6)

Keywords: medical education, quality assessment, Bologna process studying.

REFERENCES

1. Masic I. Quality Assessment of Medical Education – why Bologna? *Mater Sociomed.* 2007; 19(2): 122-4.
2. Masic I. Quality Assessment of Medical Education at Faculty of Medicine of Sarajevo University – Comparison of Assessment Between Students in Bologna Process and Old System of Studying. *Acta Inform Med.* 2013; 21(2): 76-82. doi:10.5455/aim.2013.21.76-82.
3. Masic I, Begic E. The Actual (Un)usefulness of the Bologna System in Medical Education. *Med Arch.* 2016; 70(2): 158-63. doi:10.5455/medarh.2016.70.158-163.
4. Masic I, Ramic-Catak A, Kudumovic M, Pasic E. Distance learning in the medical education in B&H: E-health and Education. *E-health and education. Proceedings, Zagreb, 2002:* 17.
5. Masic I. Medical informatics education in Bosnia and Herzegovina. *IMIA Yearbook.* 2004: 192-6.
6. Masic I. *Porodicna/Obiteljska medicina - principi i praksa.* Avicena. Sarajevo, 2007.

Student Assessment of Family Medicine Course at Faculty of Medicine, University of Tuzla

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ABSTRACT

Introduction: Although the Bologna Process hasn't arrived at a crucial point in Bosnia and Herzegovina (1, 2), the great changes have made in teaching and student assessment of learning achievements. **Aim:** To analyze student assessment of Family Medicine course at Faculty of Medicine, University of Tuzla. **Material and Methods:** Students have obligatory 19-weeks course in Family Medicine according to the Bologna system. In XI semester students have 30 hours of lectures (divided into three modules) and 30 hours of practical work (5 ECTS). In XII semester students have Clinical Internship for one month (176 hours) (6 ECTS). Examination methods are divided into: two midterm exams, a seminar paper and final exam. **Results:** Midterm exam 1 and Midterm exam 2 include tests with 15 MCQ and short answer questions from Module 1 and Module 2. Students receive 1 point for each question answered correctly and can get 15 points maximum. Minimum score that must be met in order to pass is 9 points. During the course students have to write a seminar paper on a subject relevant to family medicine. Students can get 7 points maximum for the seminar paper. The final exam consists of two parts: OSCE (objective structured clinical examination) and final written test. OSCE is a case related to a specific clinical problem of the patient with a checklist. Each correct answer is scored 1 point. Students can get 10 points maximum; minimum passing score is 6 points. The final written test has 46 MCQ and short answer questions from all modules. Each correct answer is scored 1 point. Students can get 46 points maximum; minimum passing score is 28 points. **Conclusion:** The education system based on a high-quality Family Medicine course has proven the most suitable way in providing a quality patient care for our service population. **Keywords:** student assessment, family medicine course.

REFERENCES

1. Masic I, Begic E. The Actual (Un)usefulness of the Bologna System in Medical Education. *Med Arch.* 2016; 70(2): 158-63. doi:10.5455/medarch.2016.70.158-63.
2. Masic I. Quality Assessment of Medical Education at Faculty of Medicine of Sarajevo University – Comparison of Assessment Between Students in Bologna Process and Old System of Studying. *Acta Inform Med.* 2013; 21(2): 76-82. doi:10.5455/aim.2013.21.76-82.

The role of debriefing in formative assessment of medical studentsMaja Racic¹, Srebrenka Kusmuk¹, Dejan Bokonjic²

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ABSTRACT

Introduction: Debriefing as formative assessment is an interactive process in which skills and understanding are cocreated in a dialogue between teacher and students (1, 2). **Aim:** To analyze the role of debriefing in formative assessment of medical students during the course in family medicine at Faculty of Medicine Foca. **Material and Methods:** Undergraduate students at Faculty of medicine in Foca have mandatory 30-weeks long course in family medicine, divided into XI and XII semester. The course consists of theoretical (60 hours) and practical (60 hours) classes. The evaluation of students' knowledge or behavior is usually standardized to ensure valid, reliable results, and includes formative as well as summative assessment. Summative assessment occurs at the end of the training period and involves grades. However, formative assessment is carried out throughout the whole training period, as feedback on subtasks of a family medicine profession or skill set. Debriefing or post-experience analysis is one of the most important features of simulation based education in family medicine, relying on predetermined learning objectives. As such, it is often used as a method of formative assessment, after simulation or real clinical event. **Results:** Process of debriefing includes three steps. A reactions phase occurs immediately after the stimulation or real clinical event has ended. The students and the teacher-debriefer get together for the conversation to get an insight of what is the most concerning to students. During an analysis or an understanding phase, students' performance, approach to problem or task execution are discussed and analyzed. The goal of a summary phase is to review lessons learned. **Conclusion:** Debriefing is good opportunity to discuss, analyse and

review students' performance and knowledge. It makes sense of what happened during consultation and integrates lesson learned to improve communication and clinical skills in the future.

Keywords: debriefing, formative assessment, family medicine.

REFERENCES

1. Gardner R. Introduction to debriefing. *Seminars in perinatology*. 2013; 37: 166-74. doi: <http://dx.doi.org/10.1953/j.semperi.2013.02.0008>.
2. Rudolph JW, Simon R, Raemer DB, Eppich WJ. Debriefing as formative assessment: closing performance gaps in medical education. *Acad Emerg Med*. 2008; 15(11): 1010-6. doi: 10.1111/j.1553-2712.2008.00248.x.

Challenges in evaluation students' knowledge after elective course of Doctor and patient-family

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ABSTRACT

Introduction: According to identifying strategic labor market needs and those of the academic community on University of Zenica, Faculty of Health in 2016 was transformed to Faculty of Medicine. Within the Faculty are two study programs: general health care (concept 4 + 1 + 3 years) and general medicine (concept of integrated studies, 6 years / 12 semesters). Despite the Bologna system in Bosnia and Herzegovina facilitate the students' learning, did not give all answers regarding the organization. Still we have challenges in assessing students' knowledge in the pre-exam activities and type of final exam (1, 2). **Aim:** To analyze methods of valorisation students knowledge after completing the elective

course Doctor patient - family on Faculty of Medicine, University of Zenica. **Material and Methods:** At first semester, elective course related to Family medicine, Doctor and patient / family has done. On 15-weeks course students have 15 hours of lectures (1 ECTS). Obligations of students during the course are to choose 1/5 topics and to write a seminar paper. Final test (sample questions) consisted of 10 questions with short and specific answers. The points depend on the complexity of the question and carry certain number of points specified on the test form. **Results:** We collected 60 seminar papers/tests. Dominated seminar paper topics by the following: 1) bad vs. good communication doctor / patient (26); 2) why I chose to be a doctor (18); 3) how primary care is organize in your town (7); 4, 5) patient's and doctor's perception public health (9). To pass final test students needs to have more than 20 (at least 51%) of 40 points maximum. **Conclusion:** In order of acquiring competence after finishing the course a challenge for lecturers is adequate evaluation of student knowledge.

Keywords: student competence, family medicine, elective course.

REFERENCES

1. Masic I, Begic E. The Actual (Un)usefulness of the Bologna System in Medical Education. *Med Arch*. 2016; 70 (2): 158-63. doi:10.5455/medarh.2016.70.158-163.
2. Nuovo J, Bertakis KD, Assessing resident's knowledge and communication skills using four different evaluation tools. *Med Educ*. 2006 Jul; 40(7): 630-6. doi: 10.1111/j.1365-2929-2006.02506.x.

Student's assessment at the Department of Family Medicine, Medical faculty University of Banja Luka

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ABSTRACT

Introduction: Implementation of a new model of primary health care in Bosnia and Herzegovina started within Canadian International Development Agency (CIDA) project. During two decades there have been changes in curriculum and student assessment. **Aim:** To analyze student assessment at family medicine. **Methods:** In 1998. and 1999. theoretical part included 20 hours of teaching and was done by Canadian teachers. The subject was not obligatory and student's knowledge was not assessed. In March 2001. Family Medicine Department (FMD) was established at the Medical faculty Banja Luka and family medicine became obligatory subject. There were 20 hours of theoretical part and 100 hours of practical part of teaching. Assessment included test with multiple choice questions (MCQ) and students were obliged to reach at least 60% of correct answers to pass the exam. In school year 2004/2005. theoretical part was increased to 60 hours and practical part was increased to 180 hours. Student's assessment was the same (MCQ). **Results:** In 2012. and 2013. the first generation of medical students was attending FM subject during the sixth year according to Bologna rules within Higer Education Reform. There have been 60 hours of theoretical part and 90 hours of practical part of teaching in XI semester. Students attend 75 hours of Clinical Course in Educational Center Primary Health Care in Banja Luka during XII semester. Assistants are engaged in practical part of teaching and pre-examination evaluation. The evaluation includes two colloquiums in 7th and 15th week of XI semester and attendance to practical and theoretical teaching. Each colloquium is scored with 15 points and attendance to practical and theoretical teaching is scored with 10 points each. Final exam includes MCQ test. **Conclusion:** In the end of each year, students evaluate teaching at all departments of Medical faculty. FMD has been constantly one of the best evaluated.

Keywords: Department of Family Medicine, education, student's Assessment.

REFERENCES

- Tešanović G, Stanetić K, Petrović V, Savić S. Porodična medicina. Narodna i univerzitetska biblioteka Republike Srpske, Banja Luka, 2014.
- Račić M, Eremija S, Mašić S, Joksimović BN, Stanetić K. Family physician's perspectives on clinical guidelines, a survey from the Republic of Srpska, Bosnia and Herzegovina. *Eur J Gen Pract.* 2016; 11: 1-6.
- Masic I, Skopljak A, Jatić Z. Comparative Review of Education Programs of Family Medicine (FM) in Bosnia and Herzegovina and Several Transition Countries. *Mater Sociomed.* 2014; 26(6): 411-8. doi: 10.5455/msm.2014.26(6).411-8.
- Secic D, Husremovic D, Kapur E, Jatic Z, Hadzi-ahmetovic N, Vojnikovic B, Fajkic A, Meholjic A, Bradic L, Hadzic A. Medical students' vs. family physicians' assessment of practical and logical values of pathophysiology multiple-choice questions. *Adv Physiol Educ.* 2017; 41(1): 62-8. doi: 10.1152/advan.00145.2015.

Evaluation of knowledge and skills acquired at the training in general medicine at the Medical Faculty in Podgorica

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ABSTRACT

The subject General medicine at Medical Faculty in Podgorica was introduced in 2001 as one semester course, with 30 classes in total for the students of the final, sixth year of Medical Faculty. The course consists only of practical education. In 2014 was taken by the Departement of Family Medicine, and they adjusted its content to the primary health care approach. It's concept presents the logical consequence of the content which is being studied through the Family medicine course on the fourth and fifth year of studies, with the emphasis on the skills based on solving the most common and the most urgent health problems in primary health care. Training of skills for managing urgent health problems is performed in demonstration hall at the Medical Faculty and the level of competence is evaluated immediately on the spot. For solving the most common health problems, the method called Multiply Easy Questions (MEQ) is being applied, which demands very active participation of students so they can present their personal attitude and discuss those issues, and at the same time, this method enables the mentor to have a complete insight of students' knowledge, skills and competences. The subject General medicine is optional at the moment as well as Family medicine. The mark, for the

above mentioned exams, is descriptive: pass or fail. For the time being the students' acquired knowledge, skills and competences are checked only through the test at the end of semester. However, from this year the exam will be expanded through objective structured clinical examination (OSCE) and MEQ inquiries. According to the reform of the present curriculum this exam with its content will be incorporated in Family medicine course, which will become obligatory and will consist of 90 classes in total.

Keywords: education, general medicine, skills.

REFERENCES

1. Kezunovic LC, Drecun M, Svab I. Primary care reform in Montenegro. *Zdravstveno Varstvo*. 2013; 52(4): 247.
2. Lacasse M, Ratnapalan S. Teaching-skills training programs for family medicine residents: systematic review of formats, content, and effects of existing programs. *Can Fam Physician*. 2009; 55(9): 902-3. e1-5.

Family medicine: Teaching practical skills and evaluating students' knowledge

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ABSTRACT

Introduction of family medicine in the undergraduate curriculum of the Faculty of Medicine in Podgorica, gave the students the opportunity to familiarize themselves with the knowledge and skills required for practicing this scientific discipline. The course consists of theoretical and practical part. During the practical part, students have 14 hours of training in the various organization units of the Primary health care center Podgorica. Training is organized individually for each student or for groups of 2 to 3 students. The goal of this part of the course is to give the students the opportunity to learn and perform skills that are less represented in other clinical disciplines. Some of the skills are: patient centered approach and problem management, health promotion and disease prevention, effective communication with patients, family, colleagues and other health

care workers, performance and interpretation of other clinical skills such as insulin application, capillary glycaemia measurement, spirometry, ECG, inhalation therapy etc. Knowledge evaluation is an important part of this course because it tends to motivate and guide what and how students learn. It is done through direct observation and feedback, tests and seminars. Emphasis is always placed on a holistic approach to the patient instead disease centered approach. This way of organizing students' practices enables them to become familiar, already during their medical studies, with the way how the primary health care functions. It also enables them to understand the place and the role of family medicine in the health system and realize its importance for the whole community.

Keywords: family medicine, practical skills, knowledge evaluation.

REFERENCES

1. Ramanayake RPJC, De Silva AHW, Perera DP, Sumanasekara RDN, Gunasekara R, Chandrasiri P. Evaluation of Teaching and Learning in Family Medicine by Students: A Sri Lankan Experience. *J Family Med Prim Care*. 2015; 4(1): 3-8.
2. Stange KC, Miller WL, McWhinney I. Developing the knowledge base of family practice. *Fam Med*. 2001; 33(4): 286-97.

Family Medicine Certification Exam: first time organized by it's parent department

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ABSTRACT

For years long family medicine residency started at Medical Faculty Podgorica University of Montenegro on January 2013 when the preconditions are met (policy, capacity, infrastructural etc). At first we enrolled 24 residents from different municipalities of Montenegro, most of them from Podgorica. After that, when Primary health centers recognized need, and Ministry of health gave a permission, we received new residents. We have had 41 of them in December 2016. Sixteen of residents fulfilled all prerequisites to take final exam. Six

of them have given up, and ten started the exam. Final exam considered preparatory phase of evaluation and two days exam. In the preparatory phase we visited all residents' clinics and assessed: layout and equipment, recording and patients visits. Before that, residents prepared the report of living environment and population, data about the clinic (organization and analysis of work performed in the past 3 months), a report on the patients family (for example) with genograms, quality monitoring data, analysis of the most frequently prescribed drugs (antibiotics, antihypertensive, benzodiazepines, antidepressants), prepared health education materials. All residents have prepared report on five of his/her patients: acute, chronic, home visits, treatment for the disability-pension commission, the patient optionally which will be presented at the oral exam. The written part of the exam consisted of a theoretical part (eliminatory test) and practical (gradually solve the problem-MEQ). Oral exam had a practical part (demonstration of skills) and theoretical: report on cases prepared, and theoretical issues of the three board members, two of which are teachers from the Department of Family Medicine and a third the teacher of one of the clinical subjects. All ten candidates have successfully passed final exam this February.

Keywords: education, family medicine, residency.

REFERENCES

1. Gutkin C. Introducing the new Certification Examination in Family Medicine. *Can Fam Physician*. 2012; 58(6): 712.
2. Kezunovic LC, Drecun M, Svab I. Primary care reform in Montenegro. *Zdravstveno Varstvo*. 2013; 52(4): 247.

Basics of evaluation - summative and formative assessment

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ABSTRACT

The purpose of the evaluation is to determine whether

the pupil has achieved the learning objectives. Objectives are different and may include knowledge, skills or attitudes. **Summative assessment** is the final assessment of achieving the objectives. It is separated from the teaching and learning process. It takes place at the end of major units and at the end of the evaluation period. Evaluation of the undergraduate teaching in Medical Faculty of Ljubljana: a) 1st year: "Communication"; ABC test, written essay and oral exam; b) 2nd year 2: "Contact with the patient"; ABC test, written essay and its defense; and c) 6th year: "The primary public health": ABC test, OSCE (Objective Structured Clinical Examination) stations, oral exam. Assessment during the specialization: a) Electronic trainee sheet; b) Oral exam before duty; and c) Experimental exam. Assessment at the end of the specialization: a) Visit of the ambulatory; b) Written test (MCQ); c) Modified Essey Questions; d) OSCE stations; and e) Oral exam- Assessment after specialization: License points, courses, evaluation of mentor, official controls by Medical Chamber and insurance company, "public opinion". **Formative assessment** is a process of continuous assessment, in which the learner receives information on his knowledge and on his learning. It is embedded in the learning process and is not evaluated by conventional estimates. It provides feedback information how to move forward in his efforts to achieve the goal. The learner should be informed what level of knowledge has been achieved, encouraged to find shortage of knowledge and offered the opportunity and the way to deal with it. Feedback information must be: a) on time and with adequate frequency; b) clear and clearly linked to the objectives of learning; c) concrete, specific and useful; and d) includes proposal on how to improve.

Keywords: basics of evaluation, summative and formative.

REFERENCES

1. Hidden curriculum (2014, August 26). In S. Abbott (Ed.), *The glossary of education reform*. Retrieved from <http://edglossary.org/hidden-curriculum>
2. Hanna GS, Dettmer PA. *Assessment for effective teaching: Using context-adaptive planning*. Boston, MA: Pearson A&B, 2004.

Reflection of specialist in family medicine on Objective structured clinical examination - OSCE at Medical Faculty, "Ss Cyril and Methodius" University Skopje

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ABSTRACT

Introduction: The Objective Structured Clinical Examination (OSCE) is a method of assessing the clinical skills in postgraduate education. In Macedonia OSCEs were implemented as a part of the final exam in family medicine training since 2011 (1-3). **Aim:** To analyze reflection of the specialist in family medicine on OSCE after 1 to 5 years of finishing final exam and the role of exposure to OSCE in enhancement of their clinical skills. **Material and Methods:** A total of 119 specialists in family medicine were asked to participate in the electronic survey. Attitude about organisation and structure of OSCE, was compared with the data received from post OSCE questioner fulfilled immediately after the final exam. The survey also had a reflection on influence of OSCE on their clinical work. **Results:** 95% of specialist find OSCE enhance their clinical skills and 86% improve the patient care. 81% of the specialists were prepared during the modules, and 65.5% were learning by practising in their ambulance. 108 (90.7%) specialists attributed the change in clinical practice. The OSCE also highlighted areas of weakness in knowledge of certain clinical procedures. OSCE mostly assesses physical examination, interpretation of results and clinical procedures. The same percent of doctors have reflection on organisation and structure of OSCE (97.8 vs. 98%). From today perspective, 77% of doctors think that the OSCE need wide clinical knowledge (77% vs. 95.7%), 52% specialist fills still OSCE as a stressful part of exam. Develop new OSCE stations and practicum, as well as increase the time per station for older trainees was some of the suggestions that are acceptable. **Conclusion:**

most candidates found participation in the OSCE excellent tool of assessment, and stimulating factor for improving their clinical work.

Keywords: Objective structured clinical examination – OSCE, assessment, clinical practice, general practice.

REFERENCES

1. Schoenmakers B, Wens J. The objective structured clinical examination revisited for postgraduate trainees in general practice. *International Journal of Medical Education*. 2014; 5: 45-50. ISSN: 2042-6372. doi: 10.5116/ijme.52eb.f882
2. Jer-Chia Tsai, Keh-Min Liu, Kun-Tai Lee, et al. Evaluation of the effectiveness of postgraduate general medicine clinical examination – pilot study and reflection on the experiences of Kaohsiung medical University Hospital. *Kaohsiung J Med Sci*. 2008; 24(12).
3. Sharma MK, Chandra PS. Objective Structured Clinical Examination and its Impact on Clinical and Interpersonal Skills: Follow-up Study. *Indian J Psychol Med*. 2013 Jul-Sep; 35(3): 299-301. doi: 10.4103/0253-7176.119478

What medical students think about the summative assessment at the Department of Family Medicine: A mixed method study

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ABSTRACT

Introduction: The summative assessment of students at the Family Medicine Department, Faculty of Medicine, University of Sarajevo, consists of several parts and the final grade is based 10% on tutor's rating, 20% on the case report from the students' practice in family medicine clinics, and 70% on the written examination comprising two partial exams with various types of questions (1, 2). **Aim:** To explore students' opinions, ex-

periences and preferences about this examination process. **Material and Methods:** The research was carried out using the Concurrent Mixed Method. The quantitative part was conducted by a web-based survey consisting of 7 questions. The qualitative part included two focus groups of students who voluntarily agreed to participate. **Results:** Web-based survey was completed by 50 out of 93 sixth-year students (response rate of 53%). Twelve students participated in two focus groups. The qualitative content analysis revealed four categories of students' answers: "Fairness and clarity", "Objectivity of different types of questions", "Objectivity of various types of summative assessment" and "Suggestions and preferences". The majority of students considered the examination process to be clear and fair. About half of the students received the grade they expected. The partial exams generally evaluated the knowledge satisfactorily. The case study of the practice effectively assessed the knowledge, but less effectively the skills, and the difficulty of the exam varied depending on the examiner. Grades given by the tutors have been often unrealistic, with tutors avoiding giving higher grades due to required written explanation. In the qualitative part of the study, students emphasized that the case-based question was the best assessment method, while the MCQ and short answer questions were considered as instruments to test only the short-term knowledge. **Conclusion:** Students consider the current manner of summative assessment as good but not excellent. They predominantly state the preference for the case-based questions as the most effective method of learning and knowledge evaluation.

Keywords: focus group interviews, student evaluation, assessment, family medicine course.

REFERENCES

1. Masic I, Skopljak A, Jatic Z. Comparative Review of Education Program of Family Medicine (FM) In Bosnia And Herzegovina and Several Transition Countries. *Mater Sociomed.* 2014; 26(6): 411-8.
2. Secic D, Husremovic Dz, Kapur E, Jatic Z, Hadzi-ahmetovic N, Vojnikovic B, Fajkic F, Meholic A, Bradic L, Hadzic A. Medical Students' Vs. Family Physicians' Assessment of Practical and Logical Values of Pathophysiology Multiple-Choice Questions. *Advances in Physiology Education.* 2017; 41(1): 62-8.

The assessment of practical skills and the final exam of students

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ABSTRACT

Introduction: This study describes assessment of undergraduate medical students at Department for family medicine University of Mostar. **Method:** We assessed curriculum with a European system of points and in generally. **Results:** European credit system shows students responsibilities (1, 2): class attendance and participations - 30 hours (h)- 1 ECTS, Seminar essay - 30 h - 1 ECTS - , written exam 60 h - 2 ECTS, oral exam - 30 h - 1 ECTS. Generally the conditions for the final evaluation are: attending theoretical and practical classes, presentation of the seminar, case study, a letter from the patient and a positive assessment of mentors, OSCE (objective structured clinical examination). The students are evaluated from their mentors in practical competencies on daily basis. The practical skills are checked from mentors and dated at the Catalog of clinical skills and marked from 1 to 4 (1 - not performed, 2 - partially performed, performed with the assistance and performed completely). Communication skills are checked and marked at the end of practical training. The written exam consists of 60 multiple choice questions. The exam lasts 60 minutes. For a positive grade student should solve at least 60% of questions. The oral exam consists of three questions: one from general area, and two in the form of solving clinical problems. **Conclusion:** There are four ways of assessment of students at the Department for family medicine University of Mostar: practical skills on real patient, OSCE, written test and oral exam, which brings a total of 5 ECTS credits.

Keywords: family medicine, students, assessment.

REFERENCES

1. Masic I. Quality Assessment of Medical Education at Faculty of Medicine of Sarajevo University – Comparison of Assessment Between Students in Bologna Process and Old System of Studying. *Acta Inform Med.* 2013; 21: 76-82.
2. Metz J, Petty J. Integrating and Assessing Struc-

tural Competency in an Innovative Prehealth Curriculum at Vanderbilt University. *Acad Med.* 2017; 92: 354-9.

Summative Assessment of Family Medicine Residents in the Federation of Bosnia and Herzegovina

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ABSTRACT

Introduction: According to the current curriculum, specialization in family medicine (FM) last four years. There is also a three-year-long specialization program for those who have a specialization in other branches of medicine or for medical doctors who previously completed additional training in FM (1). Residents spend 20 months with mentors at the FM clinics and 21.5 months in hospital clinical rotation. They receive basic theoretical instruction for two weeks, followed by two-week-long training at the Public Health Institute and the Agency for Quality and Accreditation. They have a month of their choice. Those who take the three-year program have the same plan, only for a shorter period of time. In the Federation of B&H, specialization takes place in four education centers (Sarajevo, Tuzla, Mostar and Zenica) which are associated with Medical Faculties and Hospital Centers in these cities. From 1999 until present, 456 residents have successfully completed their specialization and 42 residents are currently in specialization program. **Aim:** Description of summative assessment (final exam) types for family medicine residents at Family Medicine Teaching Centers in the Federation of Bosnia and Herzegovina. **Methods and Materials:** FMTC managers' reports on the method of test. **Results:** The first generations of residents started their program two times a year (September and March), so the exam was organized twice a year. It was written exam with study cases. It contained 35 questions and

lasted for 6 hours. In the last few years, the majority of specializations have started depending on the application, so the residents are at different "levels" of specialist training. Simultaneously, the manner of assessment has also changed. Sarajevo has retained the written exam of 34 SAMP questions which precedes the practical part of the exam. It consists of 6 OSCE stations assessing skills of patient examination and ECG reading. In Tuzla, the practical part of the exam consists of 4 written cells and 4 with standardized patient, followed by oral exam with three members of the commission asking two questions. In Mostar, mentors give their assessment of the residents prior to the practical part of the exam, which includes one patient, ECG reading and one clinical skill. The rest of the exam is oral and 3 examiners ask 3 questions. Residents from Zenica take their exams either in Tuzla or Mostar. **Conclusion:** Centers have different manners of summative assessment, residents begin their programs at a different time, and it is absurd to organize a written exam which takes 6 hours per resident. However, all residents have the same specialization curriculum and there is a need for standardization of the examination process, so that the same or very similar conditions exist in all Centers for acquiring the title of a FM specialist.

Keywords: specialist, family physician, examination questions, assessment.

REFERENCES

1. Masic I, Skopljak A, Jatic Z. Comparative Review of Education Program of Family Medicine (FM) In Bosnia And Herzegovina and Several Transition Countries. *Mater Sociomed.* 2014; 26(6): 411-8.

Polypharmacy and Drug Adherence in Eldery: a Systematic Review

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ABSTRACT

Introduction: According to Eurostat, the number of people aged 65 years or more in the EU is expected to grow from around 84 million in 2008 to around 141 million by 2050 (1). Ageing is accompanied by a growing

number of chronic non-communicable diseases. A consequence of several chronic clinical conditions is not only that the elderly people tend to use multiple drugs, but as well the treatment of chronic illnesses commonly includes the longterm use of faramakotherapy. Polypharmacy increasingly is a problem in the health care of polymorbid elderly people, and affects morbidity and mortality and nevertheless polypharmacy positively correlates with an increased risk for adverse drug reactions (ADRs), as well as drug-drug and drug-disease interactions (2-5). On the other hand, polypharmacy increase the risk for medication non-adherence, which consecutively can cause suboptimal therapeutic effectiveness and poor clinical response. Medication-taking behavior is extremely complex and individual, requiring numerous multifactorial strategies to improve adherence. It involves patient, physician, and process components. Medication adherence (the patients' use of the right drug in the correct dose at the right interval) wich is a key factor associated with the effectiveness of all pharmacological therapies is essential in the treatment of the elderly. Non-adherence describes the patient who does not or only partially follow the treatment arrangements previously agreed with the doctor. Identification of nonadherence is challenging, and required specific skills. If not recognized, the non-adherence can lead to a dose augmentation of the initial medication or the addition of a second drug, thereby increasing the risk for ADRs, increased emergency visits, hospitalizations, lower quality of life and increased health care costs. An agreement is that the prevalence of non-adherence among elderly persons (26-59%), conflicting reasons for medication non-adherence have been reported. In addition, living alone, receiving drugs from different prescribers, and having cognitive problems and/or poor knowledge of the drugs prescribed have all been suggested to lead to a higher risk of non-adherence and consecutive ADRs.

Aim: The aim of our systematic review was to analyze the published literature on the polypharmacy and drug adherence in elderly living at home. **Method:** We performed a literature search using MEDLINE, ISI Web of Science, ProQuest, EMBASE, SCOPUS, Springer Link, Sage Journals and CINAHL. We used the following terms: Medication Adherence, Medication Compliance, Polypharmacy, and Elderly. The search was limited to English-language articles. We included only clinical trials, systematicreviews, meta-analysis and cross-sectional studies. **Results:** A total of seven articles were included in this systematic review after applying the

search strategy. Six studies dealt with the prevalence of medication adherence and its correlates in patients aged 65 years or more with polypharmacy. Two studies dealt with the effect of various interventions on medication adherence in patients aged 65 years or more with polypharmacy. **Conclusion:** The available literature on the polypharmacy and drug adherence in elderly living at home is scarce and further studies are needed.

Keywords: Polypharmacy; Medication Adherence; Aged; Systematic Review.

REFERENCES

1. EUROSTAT. Population data - EUROSTAT 2015 [cited 2015 July 25]. Available from: <http://ec.europa.eu/eurostat>.
2. Stewart RB, Cooper JW. Polypharmacy in the aged. Practical solutions. *Drugs Aging*. 1994; 4(6): 449-61.
3. Hajjar ER, Cafiero AC, Hanlon JT. Polypharmacy in elderly patients. *Am J Geriatr Pharmacother*. 2007; 5(4): 345-51.
4. Brown MT, Bussell JK. Medication adherence: WHO cares? *Mayo Clin Proc*. 2011; 86(4): 304-14.
5. Sabate E, editor. *Adherence to Long-term Therapies: Evidence for Action*. Geneva: WHO, 2003.

REFERENCES

- a. Masic I. Quality Assessment of Medical Education - why Bologna? *Mater Sociomed*. 2007; 19(2): 122-4.
- b. Masic I. Quality Assessment of Medical Education at Faculty of Medicine of Sarajevo University - Comparison of Assessment Between Students in Bologna Process and Old System of Studying. *Acta Inform Med*. 2013; 21(2): 76-82. doi:10.5455/aim.2013.21.76-82.
- c. Masic I, Begic E. The Actual (Un)usefulness of the Bologna System in Medical Education. *Med Arch*. 2016; 70(2): 158-63. doi:10.5455/medarh.2016.70.158-163.
- d. Masic I, Ramic-Catak A, Kudumovic M, Pasic E. Distance learning in the medical education in B&H: E-health and Education. *E-health and education. Proceedings, Zagreb, 2002*: 17.
- e. Masic I. Medical informatics education in Bosnia and Herzegovina. *IMIA Yearbook*. 2004: 192-6.
- f. Masic I. *Porodicna/Obiteljska medicina - principi i praksa*. Avicena. Sarajevo, 2007.
- g. Gardner R. Introduction to debriefing. *Seminars in perinatology*. 2013; 37: 166-74. doi: <http://dx.doi.org/10.1053/j.semperi.2013.02.008>
- h. Rudolph JW, Simon R, Raemer DB, Eppich WJ. Debriefing as formative assessment: closing performance

- gaps in medical education. *Acad Emerg Med.* 2008; 15(11): 1010-6. doi: 10.1111/j.1553-2712.2008.00248.x.
- i. Nuovo J, Bertakis KD, Azari R. Assessing resident's knowledge and communication skills using four different evaluation tools. *Med Educ.* 2006 Jul; 40(7): 630-6. doi: 10.1111/j.1365-2929.2006.02506.x
 - j. Tešanović G, Stanetić K, Petrović V, Savić S. *Porodična medicina. Narodna i univerzitetska biblioteka Republike Srpske. Banja Luka, 2014.*
 - k. Račić M, Eremija S, Mašić S, Joksimović BN, Stanetić K. Family physician's perspectives on clinical guidelines, a survey from the Republic of Srpska, Bosnia and Herzegovina. *Eur J Gen Pract.* 2016; 11: 1-6.
 - l. Masic I, Skopljak A, Jatic Z. Comparative Review of Education Programs of Family Medicine (FM) in Bosnia and Herzegovina and Several Transition Countries. *Mater Sociomed.* 2014; 26(6): 411-8. doi: 10.5455/msm.2014.26.411-418.
 - m. Secic D, Husremovic D, Kapur E, Jatic Z, Hadzi-ahmetovic N, Vojnikovic B, Fajkic A, Meholic A, Bradic L, Hadzic A. Medical students' vs. family physicians' assessment of practical and logical values of pathophysiology multiple-choice questions. *Adv Physiol Educ.* 2017; 41(1): 62-8. doi: 10.1152/advan.00145.2015.
 - n. Kezunovic LC, Drecun M, Svab I. Primary care reform in Montenegro. *Zdravstveno Varstvo.* 2013; 52(4): 247.
 - o. Lacasse M, Ratnapalan S. Teaching-skills training programs for family medicine residents: systematic review of formats, content, and effects of existing programs. *Can Fam Physician.* 2009; 55(9): 902-3.e1-5.
 - p. Ramanayake RPJC, De Silva AHW, Perera DP, Sumanasekara RDN, Gunasekara R, Chandrasiri P. Evaluation of Teaching and Learning in Family Medicine by Students: A Sri Lankan Experience. *J Family Med Prim Care.* 2015; 4(1):3-8.
 - q. Stange KC, Miller WL, McWhinney I. Developing the knowledge base of family practice. *Fam Med.* 2001; 33(4): 286-97.
 - r. Gutkin C. Introducing the new Certification Examination in Family Medicine. *Can Fam Physician.* 2012; 58(6): 712.
 - s. Hidden curriculum (2014, August 26). In: S. Abbott (Ed.), *The glossary of education reform.* Retrieved from <http://edglossary.org/hidden-curriculum>
 - t. Hanna GS, Dettmer PA. *Assessment for effective teaching: Using context-adaptive planning.* Boston, MA: Pearson A&B, 2004.
 - u. Schoenmakers B, Wens J. The objective structured clinical examination revisited for postgraduate trainees in general practice. *International Journal of Medical Education.* 2014; 5: 45-50. ISSN: 2042-6372. doi: 10.5116/ijme.52eb.f882
 - v. Tsai JC, Liu KM, Lee KT. et al. Evaluation of the effectiveness of postgraduate general medicine clinical examination - pilot study and reflection on the experiences of Kaohsiung medical University Hospital. *Kaohsiung J Med Sci.* 2008; 24(12).
 - w. Sharma MK, Chandra PS. Objective Structured Clinical Examination and its Impact on Clinical and Interpersonal Skills: Follow-up Study. *Indian J Psychol Med.* 2013 Jul-Sep; 35(3): 299-301. doi: 10.4103/0253-7176.119478
 - x. Metz J, Petty J. Integrating and Assessing Structural Competency in an Innovative Prehealth Curriculum at Vanderbilt University. *Acad Med.* 2017; 92: 354-9.
 - y. EUROSTAT. Population data - EUROSTAT 2015 [cited 2015 July 25]. Available from: <http://ec.europa.eu/eurostat>.
 - z. Stewart RB, Cooper JW. Polypharmacy in the aged. Practical solutions. *Drugs Aging.* 1994; 4(6): 449-61.
 - aa. Hajjar ER, Cafiero AC, Hanlon JT. Polypharmacy in elderly patients. *Am J Geriatr Pharmacother.* 2007; 5(4): 345-51.
 - ab. Brown MT, Bussell JK. Medication adherence: WHO cares? *Mayo Clin Proc.* 2011; 86(4): 304-14.
 - ac. Sabate E, editor. *Adherence to Long-term Therapies: Evidence for Action.* WHO. Geneva, 2003.