

Objectively Structured Practical Exams (OSPEs) in Petre Shotadze Tbilisi Medical Academy (TMA)

Akaki Sepashvili M.D., M.Sc. - Head of Clinical Skills and Objectively Structured Exams Center, Petre Shotadze Tbilisi Medical Academy, Tbilisi, Georgia

Nino Shiukashvili M.D., M.Sc. – Head of Quality Assurance Department, Petre Shotadze Tbilisi Medical Academy, Tbilisi, Georgia

Tsisana Lomashvili M.D. - Dean of the Faculty, Petre Shotadze Tbilisi Medical Academy, Tbilisi, Georgia

Tamar Gaikharashvili M.D., Ph.D. - Head of the Department for Development of Educational Programs, Petre Shotadze Tbilisi Medical Academy, Tbilisi, Georgia

Abstract

Introduction and aim:

Assessment in Medical Education holds the crucial point to get the objective results of the learning process. Evaluation of general knowledge and practical skills in Basic Undergraduate Medical Disciplines (BUMDs) can be performed by Objectively Structured Practical Exam (OSPE), still most of the Georgian Medical High Education Institutions prefer Multiple Choice Questions (MCQs).

Research methodology:

We organized the trial OSPEs and ordinary MCQs for 1st and 2nd year 75 students in Anatomy, Microbiology, Histology and Systemic Pathology. Also, we developed the questionnaire for students to reveal the characteristics of OSPE comparing to MCQs. Pearson's Correlation coefficient and Cronbach's Alpha value were calculated using SPSS Statistics.

Results and implications:

Pearson's Correlation coefficient showed HIGH correlation between the OSPE "PASS" and MCQ "PASS" rates. The Questionnaire showed that comparing to MCQ, OSPE is more difficult, more stressful but fairer, more objective and students show up more knowledge and skills. Internal Consistency for Cronbach's alpha for the questionnaire was defined as GOOD.

Conclusion:

The HIGH correlation between OSPE/MCQ "PASS" indicates that starting OSPEs in BUMDs does NOT affect the students' success rate to pass the exam, instead it will increase the motivation, focusing, concentration and depth of the students' knowledge as well as the ability to use the theoretical knowledge in practical tasks. OSPE revealed to be the trustful and reliable method in Tbilisi Medical Academy to evaluate medical students' real general knowledge and abilities. Such type of the evaluation starts making the medical student ready for clinical tasks and procedures from the initial level of medical education.

Keywords: OSPE, Anatomy, Histology, Pathology, Microbiology, evaluation, exam, objective, MCQ

1 Introduction and Aims

Assessment in Medical Education holds the crucial point to get the objective results of the learning process. Medicine is the part of the science that requires logical, intuitive, laconic and precise thinking as well as ethical, moral and social aspects comparing to other disciplines. This is the reason that evaluation of medical general theoretical knowledge is not enough to find out the real abilities of medical student.

Most of the Georgian Medical High Education Institutions generally use MCQs (Multiple Choice Questions) for evaluation of the general knowledge in Basic Undergraduate Medical Disciplines (BUMD), including Anatomy, Histology, Microbiology and Pathology.

Nowadays medicine requires not only general medical knowledge but possession of practice and clinical skills. Evaluation of the practical and clinical skills can be performed using various types of the exams, including the Clinical Evaluation Exercise (CEX) [1], Mini-Clinical Evaluation Exercise (mCEX) [2], Entrustable Professional Activities (EPA) [3], Directly Observed Procedural Skills (DOPS) [3], portfolios [4], etc. The evaluation of the practical and clinical skills is more valuable to be performed by Objectively Structured Exams, such as Objectively Structured Practical Exam (OSPE) [5] and Objectively Structured Clinical Exam (OSCE) [6]. Since its introduction to the medical curriculum in 1975 [7], the OSCE has been successfully implemented around the world as an assessment tool in a wide variety of subjects [5] [8], and such type of the exams became the choice of most leading Medical Schools to evaluate the students medical abilities.

Evaluation of Clinical Aspect for 1st and 2nd year students doesn't guarantee the objective results, as medical student integration in clinics requires some period and experience. Most important issue is to make the student ready for clinical tasks and procedures on initial level of medical education. That issue requires learning of practice skills in BUMDs (making organ section, usage of the microscope, making histopathological tissue samples, harvesting bacterial colonies, centrifugation of blood sample etc.). That kind of practice skills can be defined as the basis of future clinical thinking. We do think that the one choice for the evaluation of Practical Skills is OSPE.

The objective structural practical examination (OSPE) is a timed examination that assesses topographical and/or applied knowledge of anatomy with the use of cadaveric resources and medical images [9]. For OSPEs in Histology, Systemic Pathology and Microbiology we used the model of Anatomy OSPE exam, just instead of the macroanatomic preparations, we used the microscopical slides of normal and pathological tissue and bacterial cultures.

The research is aimed at comparison of the MCQ and OSPE descriptive and quantitative analysis to reveal the advantage and disadvantage of OSPEs in Anatomy, Histology, Pathology and Microbiology.

2 Research Methodology

We organized the trial OSPEs and normal MCQs for 1st and 2nd year students in Anatomy, Microbiology, Histology and Systemic Pathology. Also, we compiled the questionnaire for students to reveal the characteristics of OSPE comparing to MCQs. Pearson's Correlation coefficient and value of Cronbach's alpha were calculated using SPSS Statistics.

Each OSPE exam consisted of 4 stations, including **Clinical Case Review**, **Blitz Questions**, **Slideshow of different images/schemes** and **Practical Skills**. The last one was the basic practice station for all disciplines:

- Anatomy Practical Skills Station was designed to examine the student's ability to figure out anatomic structures on real organ. As soon as Georgian Constitution and Ethical Committee do not allow to use human organs and cadavers for anatomy learning, we preferred to use the

internal organs of calf, cow and pig, like heart, aort, treachea, bronchii, kidneys and eyes to show the medical students approximately simillar macroanatomic structures (little differences in sizes of organs and few anatomic structures). These organs were conserved in special hypertonic solution containing harmless substances (NO formalin). For musculoskeletal system we better to use anatomic manikins with landmarks. Medical students had a chance to write the answers on questions according the real organs or anatomic manikins, with landmarks on them.

- Histology Practical Skills Station included the usage of microscope and tissue micropreparations. The microscopy skills and tissue identification were the main tasks for the station.
- Pathology Practical Skills Station was almost simillar then Histology one, just instead of the normal tissue micropreparations pathologic ones were used.
- Microbiology Practical Skills Station focused to identify the bacterial colonies in hermetic container, also included the micropreparations of the bacterial sample to be diagnosed in microscope.

The time for each station was 5 minutes and 1 additional minute for logistics. Each station was equipped with video monitoring cameras and recording system, to superwise the student during the exam. The students had their personal Answer Paper, where they could write the answer on the questions they could find in the stations. In the end of the exam the students were asked to give us written feedback and fill structured questionnaire for descriptive analysis.

After the OSPE exam the students had to write the MCQ exam in the same disciplines.

75 students took part in the exams and we also calculated the PASS and FAIL ratio for OSPE and MCQ, for comparative analysis.

3 Results and Implications

The general opinion of the students about the OSPE was possitive, even they admitted that they had better possibility to express their knowledge and skills during OSPE comparing to the MCQs.

General Statistic data shows that almost 31% and 44% of the students FAILED during OSPE and MCQs respectively (Fig.1).

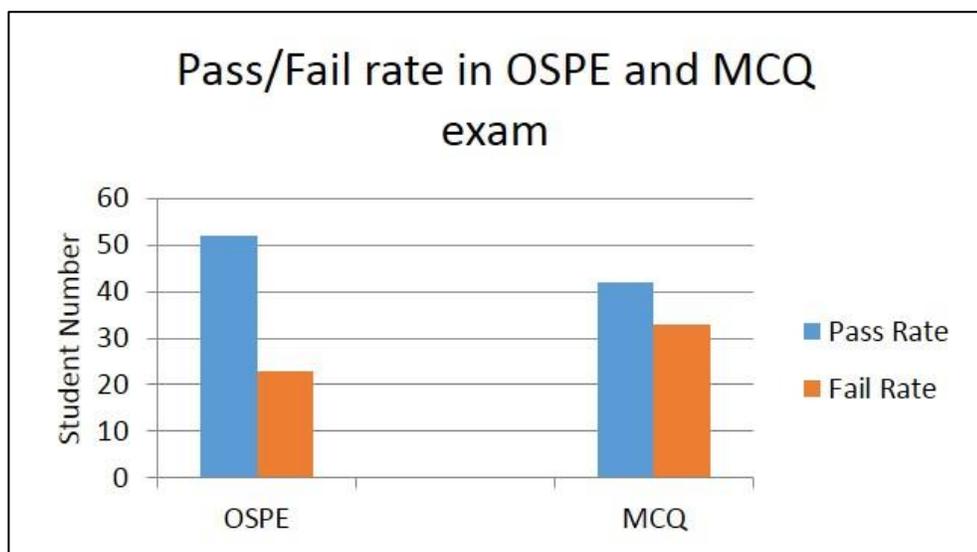


Fig.1. PASS and FAIL Rate of the students during OSPE and MCQ

The Pearson's Correlation Coefficient showed the HIGH correlation (Coefficient = 0.7, $P < 0.05$) in OSPE and MCQ pass rates. It means that students can pass both exams with almost the same efficiency and the difficulty of the exams were almost same (Fig.2).

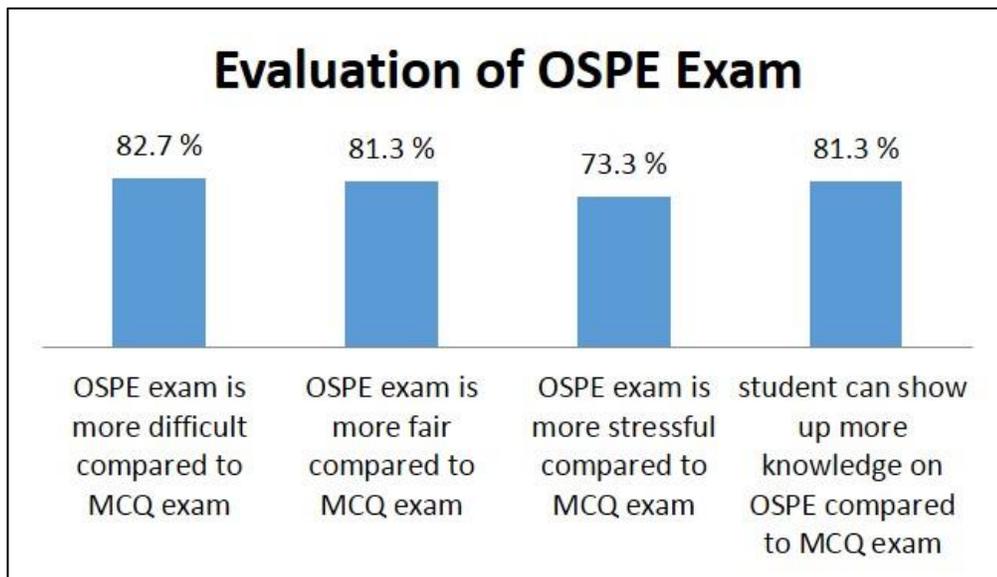


Fig.2. Pearson Correlation for MCQ and OSPE pass and fail rates.

The questionnaire comparative analysis OSPE vs MCQ revealed (Fig.3):

- OSPE is more difficult compared to MCQ.
- OSPE is more fair compared to MCQ.
- OSPE is more stressful compared to MCQ.
- Student can show up more knowledge and skills during OSPE compared to MCQ.

Internal consistency of Cronbach's Alpha was 0.81, that can be defined GOOD and means that the results are reliable.

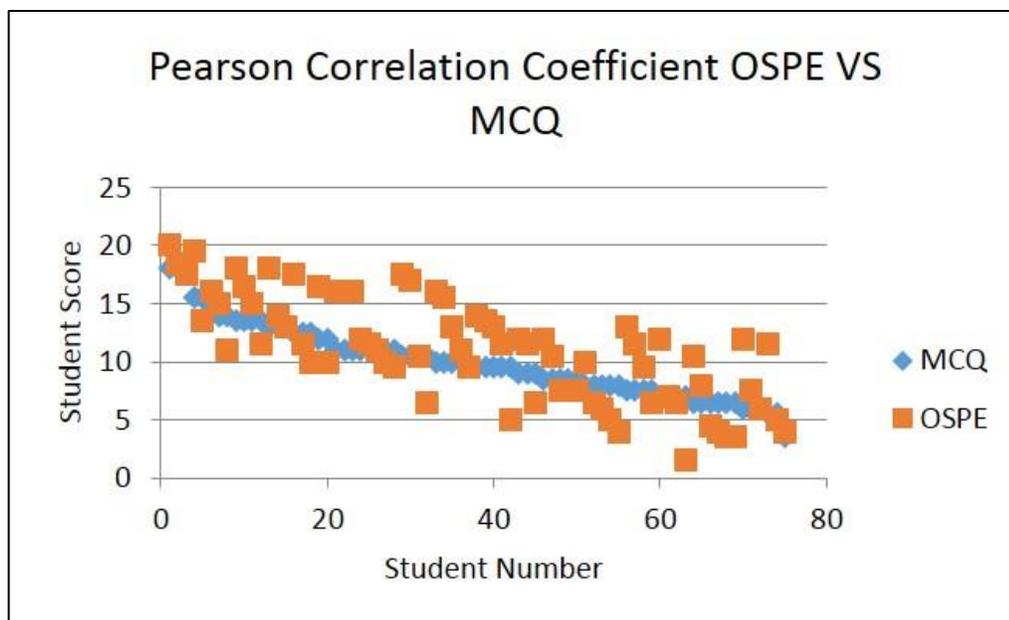


Fig.3. Questionnaire results OSPE vs MCQ.

4 Conclusion

The HIGH correlation between OSPE/MCQ "PASS" indicates that starting OSPEs in BUMDs does NOT affect the students' success rate to pass the exam, instead it will increase the motivation, focusing, concentration and depth of the students' knowledge as well as the ability to use the theoretical knowledge in practice tasks.

The fact that students discuss OSPE more difficult and stressful exam, is also positive, thus we do believe that future doctor should be ready for the stressful and extreme situations. The limited time, practical skills, clinical thinking and usage of theoretical knowledge at the same time can give medical student the valuable skills for future clinical practice.

OSPE is revealed to be the trustful and reliable method in Tbilisi Medical Academy to evaluate medical students' real general knowledge and abilities. Such type of the evaluation starts making the medical student ready for clinical tasks and procedures from the initial level of medical education.

Reference:

- [1] S. Thornton, "A literature review of the long case and its variants as a method of assessment," *Educ Med J*, p. 4 (1), 2012.
- [2] J. Norcini, L. Blank, D. Duffy and G. Fortna, "The mini-CEX: a method for assessing clinical," *Annals of Internal Medicine*, pp. 476-481, 2003.
- [3] K. Hauer, J. Kohlwes, P. Cornett, H. Hollander, O. Cate ten and S. Ranji, "Identifying entrustable professional activities in internal medicine training," *J Grad Med Educ.*, vol. 5 (1), pp. 54-59, 2013.
- [4] C. Gadbury-Amyot, M. McCracken, J. Woldt and R. Brennan, "Validity and reliability of portfolio assessment of student competence in two dental school populations: a four-year study," *J Dent Educ*, vol. 78 (5), pp. 657-667, 2014.
- [5] V. Nayak, K. Bairy, S. Adiga, S. Shenoy, B. Chogtu, M. Amberkar and K. KM., "OSPE in Pharmacology: Comparison with the conventional Method and Students' Perspective Towards OSPE," *Br Biomed Bull*, vol. 2 (1), pp. 218-222, 2014.
- [6] I. Martin and B. Jolly, "Predictive validity and estimated cut score of an objective structured clinical examination (OSCE) used as an assessment of clinical skills at the end of the first clinical year," *Med Educ.*, vol. 36 (5), pp. 418-425, 2002.
- [7] R. Harden, M. Stevenson, W. Downie and G. Wilson, "Assessment of clinical competence using objective structured examination," *BMJ*, vol. 1 (5955), pp. 447-451, 1975.
- [8] P. Petko, K. Knuth-Herzig, S. Hofer, S. Stehle, S. Scherer, B. Steffen, S. Scherzer, F. Ochsendorf, H. Horz, R. Sader and S. Gerhardt-Szép, "The reliability and predictive validity of a sixth-semester OSPE in conservative dentistry regarding performance on the state examination," *GMS J Med Educ.*, vol. 34 (1), 2017.
- [9] S. C. G. E. Sagoo MG, "Assessment of anatomical knowledge by practical examinations: The effect of question design on student performance.," *Anat Sci Educ.*, vol. 9, pp. 446-52, 2016 Oct;9(5).