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L.R. SHOSTAKOVYCH-KORETSKA,
A.V. CHERHINETS, K.Y. LYTVYN,
V.V. MAVRUTENKOV,
T.A. HAYDUK, Z.O. CHYKARENKO,
O.P. SHEVCHENKO-MAKARENKO,
M.S. SUREMENKO, I.V. BUDAYEVA

Experience in developing simulation script for performance of Objective Structured Clinical Examination – OSCE

Importance. The importance of the use of priority pedagogical technologies is due to the need for Ukraine to integrate into the world system of higher education. Within the framework of the state program of development of health care and the concept of the development of higher medical education, a complex of measures aimed at improving the training of health professionals and assessing the effectiveness of

the teaching system is being implemented. Modern standards of higher education require a radical change not only in the teaching system, but also in changing the format of certification. From May 2018 in Ukraine, for the first time in the medical institutions of higher education, an objective structured clinical examination (OSCE) was used as the second stage of primary student attestation. This latest technological method is used to assess clinical competence. The innovator of medical education and the founder of this method, Ronald Harden (1975), thus determines the significance of this pedagogical technology: "OSCE is a method of assessing clinical or professional competence in which competency components are evaluated systematically and structured with particular attention to the objectivity of the assessment". The method is based on a comprehensive assessment of numerous stations (from 10 to 20) that simulate different clinical competencies and allow you to assess the level of clinical skills and professional capabilities associated with independent medical activities. Stations of OSCE (practical tasks-modules), as a rule, represent the task of interpreting additional evaluations, assessment of communicative and manipulative skills. For 40 years of the existence of the Ronald Harden system there is a steady increase in the popularity of the method and in recent years, this method is included in almost all priority higher education systems in many countries.

Modern high-tech standards of teaching the basics of medicine involve the use of new interactive technologies, and for the OSCE the simulation method is most optimal. Simulation (clinical modeling) has been considered from the scientific point of view, as the latest method of pedagogical technology, only the last 10 years, although the waxworks have been used since ancient times. Many modern studies prove the effectiveness of using simulation training. The evaluation of practical skills of graduates with the use of simulation technologies allows us to conclude not only about the quality of individual manipulations, but also about the tactics of the actions of a future physician in the clinical situation in general. Also, specifically this method of conducting the exam allows you to fully assess the effectiveness of the teaching system itself. The objective assessment of the professional level of specialists in this method does not depend on the personality of the student or examiner and is based on numerous objective parameters of manipulation during the implementation of the model of the clinical situation, diagnostic, therapeutic measures with the help of mechanical, electronic, computer virtual models. Simulation is a separate pedagogical technology, which

should be conducted by specially trained staff instructors who will create and accumulate luggage of scripts, conduct methodical work. In the future, the development and implementation of a unified state form of assessment for simulations (evaluation letters, global rating), a briefing-debriefing is envisaged.

The goal of the article. Development of the simulation scenario (theme: Hypovolemic shock, diagnosis, emergency care) for OSCE at the second stage of the final attestation of graduates.

The application of this new pedagogical technology for our country requires compulsory analysis and discussion of system management issues to further improve the effectiveness of the interactive learning system. In the future, it is envisaged to create uniform state standards for conducting OSCE. We hope that our own experience will help to work in this direction.

The preparation for the OSCE performance consisted of several stages. At the first stage, one month before the exam, the final list of workstations, requirements for equipment, technical and computer equipment was formulated. The next step was to create a scenario for each station using simulation equipment of varying levels of realism. There were created OSCE working groups, which consisted of coordinators, examiners, standardized patients.

The course of infectious diseases, which is taught at the department, has a therapeutic orientation, so the simulation technology for creating a real atmosphere involves the use of so-called hybrid simulations, when the actor-teacher acted as a standardized patient. The target group of the analysis was the students of the 6th year of the medical establishment of higher education SE "DMA" of Dnipro city who passed the second stage of the certification state exam for the accreditation of a specialist. Based on of the simulation scenario, a technological map of the clinical situation was developed on the topic: "Emergency situation – the hypovolemic shock on the background of acute intestinal infection". The choice of the specified station was regulated by the curriculum.

The purpose of the interactive exam is to assess the student's ability to determine the presence of hypovolemic shock in the patient and provide him with primary emergency care. Seminars were held to train personnel for the OSCE, written instructions for participants of the exam were developed.

An important stage in the work was the compilation of simulation scenarios. In this case, the following principles for creating a simulation

scenario were implemented: 1. Creation of various combinations of specific cases. 2. Determination of the plotline of the game. 3. The scenario should provide the opportunity to make some necessary decisions within the stated purpose. 4. The scenario should be as close as possible to the real conditions of work. 5. The script should include student performance of certain diagnostic and therapeutic manipulations. 6. The scenario should provide a ranking of different levels of complexity of tasks. 7. Mistake control with the usage of debriefing and "KSU Feedback" system.

Traditionally, in the process of creating a scenario, the blocks of competences and intellectual functions that are planned to be assessed are determined; the specific skills and actions that should be applied in this situation are identified. Therefore, a group of experts (lecturers) was guided, first of all, by the following tasks:

1. Assess the student's ability to communicate with the patient
2. Evaluate the student's ability to collect anamnesis of the disease
3. Assess the student's ability to identify leading clinical symptoms for the diagnosis of hypovolemic shock
4. Evaluate the student's ability to offer an algorithm of emergency care with hypovolemic shock.

Expected results:

Short-term – the ability to recognize the symptoms of hypovolemic shock

Long-term – to be able to extrapolate knowledge about the diagnosis of similar states and to act adequately in similar situations

The issues of the choice of the study room and the register of technical and medical equipment for the examination were discussed. For an effective simulation performance, a task template was developed that complies with the requirements of the working curriculum. This standardized approach allows us to maintain the objectivity of assessments and avoid situations where a standardized patient is in a disadvantaged condition.

Matrix of professional competence with a description of the clinical scenario of the emergency situation of hypovolemic shock was formed for the simulator and teacher based on a single sample. To simulate this clinical situation, the presentation method of the "standardized patient" was used. Standardized Patient (SP) is a simulated patient who, during the exam, is reacting to all questions and actions of all participants in the exam in a standard, strictly regulated and the united way. The

simulated patient is a specially trained worker who uses acting skills to model patient behavior in a given scenario. The difference between the two of these categories consists of a certain regulation of the actions and responses of standardized patients in contrast to the simulated, which enables the examiners to correctly and objectively evaluate the knowledge. Professionally trained patients favorably differ from regular volunteers by their ability to give feedback, both during the simulation and during debriefing.

In preparing a standardized patient, we were guided by the recommendations of the European Association for Communication in Healthcare. It is believed that simulated patients are preferably suitable for medical communication training, however, the use of standardized patients is more rational for clinical training, in particular for conducting attestation examinations, including OSCE. Instructions and training

Table 1. The matrix of communication between the student and the standardized patient

Questions which should be asked by the student	Information from a standardized patient (simulator)
Age of the patient	25 years
Complains	Diarrhea, vomiting, weakness, drowsiness
When he became ill	9 hours ago
How the disease developed (clarification of manifestations of symptoms)	There were episodes of diarrhea every 20-25 minutes, stool of whitish color with fish smell. Three hours ago, vomiting began with a lot of fluid, and one hour ago there were convulsions in the muscles of the limbs, the patient became apathetic, drowsy, the voice became coarse, body temperature was measured once - 36.4 C
Patient's treatment before hospitalization	He used mineral water, but later vomiting joined after each swallow. He refused to drink.
What other chronic diseases the patient suffers from	No chronic diseases
Was he visiting other countries	Yes. He returned from India in the morning where he was for 7 days, visiting places at Ganges riversides.
Does he have any allergy or adverse reactions to drugs	Not observed

Table 2. Optional information (Standardized Patient and Examiner)

N	Student's activity (determination of symptoms)	Indexes
1.	Airway passability	Yes
2.	Spontaneous breathing	Yes
3.	Heart rate	123
4.	Breathing rate	18
5.	Blood pressure	78/54
6.	Body temperature	35,7
7.	Oxygen saturation (pulse oxymetry)	87
8.	Consciousness (according to Glasgow coma scale)	7
9.	Cyanosis	Yes
10.	Pinching test (skin turgor)	10 second
11.	Capillary refill symptom	> 10 seconds
12.	Mucosa	Dry
13.	Pathological respiration of Kussmaul	Yes
14.	Absence of urine	About 4-5 hours
15.	Pain	No

were conducted for the preparation of standardized patients (youth department staff). Table 1 provides the matrix of medical communication during the exam between the student and the standardized patient.

The passing of simulation clinical scenarios allows students to demonstrate the application of their knowledge in a particular clinical situation. Besides, the examiners have the opportunity to assess the important non-technical skills of medical communication.

The development of the exam project involves the regulated duration of each station. At the station in a crisis situation, "hypovolemic shock" it was given 15 minutes (Table 2).

Table 3. Stages of the clinical scenario and assessment of the student's actions.

1. The student interviews the patient (attendants) – 4 minutes
2. The standardized patient answers students' questions according to the scenario in the presence of the examiner
3. Patient's examination. During the examination, the information is provided by the simulator to the student's questions in accordance with the completed assignment, the examiners evaluate the points – 5 minutes
4. Justification and formulation of the diagnosis – 1 minute
5. Justification of the algorithm of emergency care – 3 minutes
6. Debriefing. Discussion of results (teacher with the student) – 2 minutes

The development and selection of the evaluation system was conducted per the character of the task. There are two types of evaluation: analytical and holistic (global assessment). We applied an analytical method based on the use of checklists (check-sheets). We used binary checklists (yes / no). At the same time, the assessment is made depending on whether the task has been completed or not, without specifying the quality of the task, without grading the high or low level of the task. The main advantage of binary check sheets is their potential ability to give an objective assessment and to ensure a high degree of consistency between different examiners. It was this monitoring system that was proposed by the founder of interactive teaching methods and OSCE, Ronald Harden.

Checklists were developed separately for each station according to an agreed topic. The checklist is a scoring scale for each specific task, and the amount of points allows you to assess the quality of the task as a whole. Preparing an assessment checklist requires a clear definition of objective criteria for each task that is based on the goals and objectives of the curriculum. Questions for assessing the student's work should be standardized for a strictly regulated algorithm for diagnostic and therapeutic measures. It is believed that checklists are an adequate objective method for assessing the performance of a task. The allocation of points for evaluation of each stage of the task was carried out by a group of teachers of the department (experts). At the same time, the following criteria were taken into account as – the complexity of the question, the hypothetical time for the student's reaction to the task. In our case, the station was supervised by the examiner without technical support. In this case, domains such as: communicative skills, skills of manipulation, clinical examination skills, interpretation of paraclinical evaluation, diagnostic and therapeutic algorithms compilation skills were evaluated. For a structured assessment, each manipulation was divided into numerous intermediate checkpoints. At all stations, the total amount of points was 50. Below is the data on the assessment scale on the station.

Table 4. Assessment of anamnesis, ability to communicate with the patient (5 points)

Questions which must be asked by the student	Information from the attendants (simulator)	Their usage by the student		Points
Age of the patient	25 years	Yes ☐	No ☐	0.5
Complains	Diarrhea, vomiting, weakness, drowsiness	Yes ☐	No ☐	1
When he became ill	9 hours ago	Yes ☐	No ☐	0.5
How the disease developed (clarification of manifestations of symptoms)	There were episodes of diarrhea every 20-25 minutes, stool of whitish color with a fish smell. Three hours ago, vomiting began with a lot of fluid, and one hour ago there were convulsions in the limbs muscles, the patient became apathetic, drowsy, the voice became coarse, body temperature was measured once – 36.4 C	Yes ☐	No ☐	1
Patient's treatment before hospitalization	He used mineral water, but later vomiting joined after each swallow. He refused to drink.	Yes ☐	No ☐	0.5
What other diseases the patient suffers from	No chronic diseases	Yes ☐	No ☐	0.5
Was he visiting other countries	Yes. He returned from India in the morning where he was during 7 days, visiting places at Gange's riversides.	Yes ☐	No ☐	0.5
Does he have any allergy or adverse reactions to drugs	Not observed	Yes ☐	No ☐	0.5

Table 5. Assessment of the ability to conduct a clinical examination and determine the main syndrome (15 points)

N	Student's activity (determination of symptoms)	Their performance		Point
1.	Airway pass ability	Yes ☐	No	1
2.	Spontaneous breathing	Yes ☐	No	1
3.	Heart rate	Yes ☐	No	1
4.	Breathing rate	Yes ☐	No	1
5.	Blood pressure	Yes ☐	No	1
6.	Body temperature	Yes ☐	No	1
7.	Oxygen saturation (pulse oxymetry)	Yes ☐	No	1
8.	Consciousness (according to Glasgow coma scale)	Yes ☐	No	1
9.	Cyanosis	Yes ☐	No	1
10.	Pinching test (skin turgor)	Yes ☐	No	1
11.	Capillary refill symptom	Yes ☐	No	1
12.	Mucosa	Yes ☐	No	1
13.	Pathological respiration of Kussmaul	Yes ☐	No	1
14.	Absence of urine	Yes ☐	No	1
15.	Pain	Yes ☐	No	1

Assessment of the diagnosis (10 points)

- Based on the data obtained, the student formulates an emergency case that developed in the patient
- The teacher estimates its correctness

Table 6. Assessment of the ability to conduct a clinical examination and determine the main syndrome (15 points)

Diagnosis of the patient	Correctness		Points
Hypovolemic shock (dehydration shock)	Yes	No	10

Assessment of Emergency Care (20 points)

- The student indicates the steps to be taken in a patient with hypovolemic shock
- The student's response is assessed by the examiner for the items listed below

Table 7. Score (teacher)

N	Student's actions	Their performance		Points
		Yes	No	
1.	Laying a patient with raised legs	Yes	No	4
2.	Oxygen therapy through a mask (cannula)	Yes	No	4
3.	Catheterization of the major vein (vein)	Yes	No	4
4.	The bolus of 0.9% NaCl or Ringer Lactate 500-1000ml (depending on age)	Yes	No	5
5.	Preparation for repeat bolus, cardiopulmonary resuscitation, providing information to ICU	Yes	No	3

In recent years, there is information that calls into question the objectivity and high probability of the analytical method. Together with the analytical method it is proposed to use the holistic (global) method for evaluating the results of examinations, which involves assessing the quality of the task, including non-technical, communicative skills of students.

A special role in simulation is performed by debriefing. Debriefing (discussion) includes the following steps:

- The teacher briefly points out the mistakes
- The student summarizes his decisions
- The teacher sets the final score for the task

Thus, in the process of problem analysis and the quality of their implementation, a step-by-step analysis of the actions and decisions of students is conducted. It is recommended to use the method of "scholastic" conversation during debriefing, which allows teachers to comprehensively evaluate the work done by the student. Debriefing allows us to focus students on the exam results, identify key points, and cause and result in a relationship. In the process of debriefing, a structured analysis of case events is conducted, discussing a series of questions.

The following scenario was followed by an exam. After the completion of the exam, an audit of the teachers and participants of the simulation was conducted to evaluate certain activities performed, identify the disadvantages and positive aspects of the exam and identify further steps to improve this form of work. The positive aspect of the new format of the exam was the satisfaction of the main participants of the work – students themselves, as well as the ability to assess the communicative properties of students, their degree of awareness in the provision of emergency care in a

crisis situation in practice. The issue of calculating the duration of certain sections of work and the issue of technical and computer equipment of the stations require further development.

Authors

Shostakovych-Koretska Lyudmyla,
*Professor, Doctor of Medical Sciences,
Head of the Department of Infectious Disease,
DZ "Dnipropetrovsk Medical Academy of the
Ministry of Health of Ukraine",
Dnipro, Ukraine
E-mail: shost3@gmail.com*

Cherginets Artem,
*Candidate of Medical Sciences,
Associate Professor,
Department of Infectious Diseases,
DZ "Dnipropetrovsk Medical Academy of the
Ministry of Health of Ukraine",
Dnipro., Ukraine,
E-mail: cherginets@ukr.net*

Lytvyn Kateryna,
*Candidate of Medical Sciences,
Associate Professor,
Department of Infectious Diseases,
DZ "Dnipropetrovsk Medical Academy of the
Ministry of Health of Ukraine",
Dnipro, Ukraine
E-mail: k-lytvyn@ukr.net*

Mavrutenkov Viktor,
*Doctor of Medical Sciences, Professor,
Head of the Department of Infectious Diseases,
DZ "Dnipropetrovsk Medical Academy
of the Ministry of Health of Ukraine",
Dnipro, Ukraine
E-mail: vvmavr@gmail.com*

Hayduk Tamara,
*Candidate of Medical Sciences, Associate Professor,
Department of Infectious Diseases,
DN "Dnipropetrovsk Medical Academy of the
Ministry of Health of Ukraine",
Dnipro, Ukraine
E-mail: tamara.gayduk@gmail.com*

Chikarenko Zoya,
*Candidate of Medical Sciences,
Associate Professor,
Department of Infectious Diseases,
DZ "Dnipropetrovsk Medical Academy of the
Ministry of Health of Ukraine",
Dnipro, Ukraine
E-mail: zchykar@ukr.net*

Shevchenko-Makarenko Olga,
*Candidate of Medical Sciences,
Associate Professor,
Department of Infectious Diseases,
DZ "Dnipropetrovsk Medical Academy of the
Ministry of Health of Ukraine",
Dnipro, Ukraine
E-mail: olga-shev@ukr.net*

Suomenko Mykola,
*Candidate of Medical Sciences,
Associate Professor,
Department of Infectious Diseases,
DZ "Dnipropetrovsk Medical Academy of the
Ministry of Health of Ukraine",
Dnipro, Ukraine*

Budaeva Iryna,
*Candidate of Medical Sciences,
Assistant Professor, Department of Infectious Diseases,
DZ "Dnipropetrovsk Medical Academy of the*

Ministry of Health of Ukraine",
Dnipro, Ukraine
E-mail: irina.repushka@gmail.com

Abstracts

SZOSTAKOWYCZ-KORECKA L., CZERHINEC A., ŁYTWIN K., MAWRUTENKOW W., HAJDUK T., CZYKARENKO Z., SZEWCZENKO-MAKARENKO O., SUREMENKO I., BUDAJEWA I. **Doświadczenie w tworzeniu scenariusza symulacyjnego dla przeprowadzenia Obiektywnego Strukturalizowanego Egzaminu Klinicznego - OSEK (OSCE).** Pilna potrzeba zastosowania priorytetowych technologii pedagogicznych wynika z aspiracji Ukrainy do integracji ze światowym systemem edukacji. Współczesne standardy szkolnictwa wyższego wymagają radykalnej zmiany nie tylko w systemie nauczania, ale także zmiany formatu przeprowadzenia państwowej atestacji końcowej absolwentów. W artykule przedstawiono doświadczenia związane ze stworzeniem scenariusza symulacyjnego dla przeprowadzenia Obiektywnego Strukturalizowanego Egzaminu Klinicznego - OSEK (OSCE). Według tego scenariusza przeprowadzono państwową atestację końcową absolwentów. Po jej zakończeniu przeprowadzono audyt wykładowców i uczestników-aktorów, aby ocenić pewne aspekty przeprowadzonej pracy, zidentyfikować zarówno wady, jak i pozytywne strony, a także określić dalsze kroki w celu poprawy tej formy pracy. Pozytywnym aspektem nowego formatu atestacji okazała się satysfakcja studentów, a także możliwość przeprowadzenia oceny umiejętności komunikacyjnych studentów, stopnia ich gotowości do udzielania pomocy w nagłych wypadkach w praktyce. Wraz z tym konieczne jest poprawienie kwestii obliczania czasu trwania niektórych rozdziałów pracy i kwestii sprzętu technicznego i komputerowego stacji symulacyjnych.

Słowa kluczowe: Obiektywny Strukturalizowany Egzamin Kliniczny (OSCE), scenariusz symulacyjny, kontrolne check-listy, debriefing.

ШОСТАКОВИЧ-КОРЕЦЬКА Л.Р., ЧЕРГІНЕЦЬ А.В., ЛИТВІН К.Ю., МАВРУТЕНКОВ В.В., ГАЙДУК Т.А., ЧИКАРЕНКО З.О., ШЕВЧЕНКО-МАКАРЕНКО О.П., СУРЕМЕНКО М.С., БУДАЄВА І.В.. **Досвід розробки симуляційного сценарію для проведення Об'єктивованого Структурованого Клінічного Іспиту - ОСКІ (OSCE).** Актуальність застосування пріоритетних

педагогічних технологій обумовлена прагненням України інтегруватися у всесвітню систему освіти. Сучасні стандарти вищої освіти вимагають кардинальну зміну не тільки системи викладання, але і зміни формату проведення державної підсумкової атестації випускників. В роботі представлений досвід розробки симуляційного сценарію для проведення об'єктивованого структурованого клінічного іспиту – ОСКІ (OSCE). За цим сценарієм проводилась підсумкова атестація випускників. По її завершенню був здійснений аудит викладачів та учасників-акторів з метою оцінки певних заходів проведеної роботи, виявлення, як недоліків, так і позитивних сторін, а також визначення подальших кроків для удосконалення даної форми роботи. Позитивним аспектом нового формату атестації виявилась задоволеність самих студентів, а також можливість проведення оцінки комунікативних властивостей студентів, ступеню їх обізнаності при наданні невідкладної допомоги на практиці. Поряд з цим, потребує удосконалення питання розрахунку тривалості певних розділів роботи та питання технічного і комп'ютерного оснащення симуляційних станцій.

Ключові слова: об'єктивований структурований клінічний іспит (ОСКІ), симуляційний сценарій, контрольні чек-листи, дебрифінг.

ШОСТАКОВИЧ-КОРЕЦКАЯ Л.Р., ЧЕРГИНЕЦ А.В., ЛИТВИН К.Ю., МАВРУТЕНКОВ В.В., ГАЙДУК Т.А., ЧИКАРЕНКО З.А., ШЕВЧЕНКО-МАКАРЕНКО А.П., СУРЕМЕНКО М.С., БУДАЕВА И.В. Опыт разработки симуляционного сценария для проведения Объективированного Структурированного Клинического Экзамена – ОСКЭ (OSCE). Актуальность применения приоритетных педагогических технологий обусловлена стремлением Украины интегрироваться во всемирную систему образования. Современные стандарты высшего образования требуют кардинального изменения не только системы преподавания, но и изменения формата проведения государственной итоговой аттестации выпускников. В работе представлен опыт разработки симуляционного сценария для проведения объективированного структурированного клинического экзамена – ОСКЭ (OSCE). По этому сценарию проводилась итоговая аттестация выпускников. По ее завершенню был осуществлен аудит преподавателей и участников-актеров для оценки определенных мер проведенной работы, выявление как недостатков, так и положительных сторон, а также определения дальнейших шагов по совершенствованию данной формы работы.

Положительным аспектом нового формата аттестации оказалась удовлетворенность самих студентов, а также возможность проведения оценки коммуникативных свойств студентов, степени их осведомленности при оказании неотложной помощи на практике. Наряду с этим, требует усовершенствования вопрос расчета продолжительности определенных разделов работы и вопросы технического и компьютерного оснащения симуляционных станций.

Ключевые слова: объективизированный структурированный клинический экзамен (ОСКЭ), симуляционный сценарий, контрольные чек-листы, дебрифинг.

SHOSTAKOVICH-KORETSKAYA L.R., CHERHINETS A.V., LYTVYN K.Y., MAVRUTENKOV V.V., HAYDUK T.A., CHYKARENKO Z.O., SHEVCHENKO-MAKARENKO O.P., SUREMENKO M.S., BUDAYEVA I.V. **Experience in developing simulation script for performance of Objective Structured Clinical Examination (OSCE).** *The importance of the application of priority pedagogical technologies is dictated by Ukraine's aspirations to integrate into the world system of education. Modern standards of higher education require a radical change not only in the teaching system, but also in the format of the state final graduation certificate. The article presents the experience of developing a simulation scenario for the objective structured clinical examination (OSCE) performance. According to this scenario, the final certification of graduates was conducted. Upon completion, an audit of teachers and participants-actors was conducted to evaluate certain activities of the work, identify both disadvantages and positive aspects, as well as identify further steps to improve this form of work. The positive aspect of the new format of attestation was the satisfaction of the students themselves, as well as the ability to evaluate the communicative properties of students, the degree of their awareness in the provision of emergency care in practice. Along with this, it is necessary to improve the issue of calculating the duration of certain sections of work and the issue of technical and computer equipment of simulation stations.*

Keywords: Objective Structured Clinical Examination (OSCI), simulation scenario, control checklists, debriefing.