Razvoj kliničnega tutorstva na Medicinski fakulteti Univerze v Mariboru

The evolution of clinical skills peer teaching at the Faculty of Medicine, University of Maribor

Avtor / Author

Ustanova / Institute

Petra Rižnik[1,2], Sebastjan Bevc[2,3]

[1]Zdravstveni dom dr. Adolfa Drolca Maribor, Slovenija; [2]Univerza v Mariboru, Medicinska fakulteta, Center za izobraževanje v medicini, Laboratorij kliničnih veščin, Maribor, Slovenija; [3]Univerzitetni klinični center Maribor, Klinika za interno medicino, Maribor, Slovenija

[1]Healthcare Centre dr. Adolf Drolc, Maribor, Slovenia; [2]University of Maribor, Faculty of Medicine, Centre for Medical Education, Clinical Skills Laboratory, Maribor, Slovenia; [3]University Medical Centre Maribor, Clinic for Internal Medicine, Maribor, Slovenia

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Petra Rižnik, dr. med.
Zdravstveni dom dr. Adolfa Drolca Maribor, OE Splošno zdravstveno varstvo, Ulica talcev 9,
2000 Maribor, Slovenija
Telefon + 386 41983957
Fax + 386 23312393
E–pošta: petra.riznik@gmail.com

Izvleček

Mlajša medicinska fakulteta v Sloveniji je Medicinska fakulteta Univerze v Mariboru. Že od ustanovitve uspešno vključuje študente v študijski proces, kar je pripomoglo k vzpostavitvi sistema tutorstva in s tem tudi novega načina ocenjevanja študentov, objektivnega strukturiranega kliničnega izpita, ki je bil vpeljan skupaj s kliničnim tutorstvom.

Prispevek se osredotoča na razvoj kliničnega tutorstva in posledično implementacijo objektivnega strukturiranega kliničnega izpita kot oblike ocenjevanja študentov na Medicinski fakulteti Univerze v Mariboru.

Abstract

The Faculty of Medicine at the University of Maribor is the younger of the two medical faculties in Slovenia. Since its foundation, it has been successfully engaging students in the educational process. The result of students´ involvement is the introduction of peer teaching, and along with that, the incorporation of objective structured clinical examination (OSCE) as an assessment method. This paper focuses on the development of clinical skills peer teaching and its accompanying tool of assessment, OSCE, at the Faculty of Medicine, University of Maribor.

INTRODUCTION

Peer teaching has become an important part of medical education. During the past decade, it has been shown that it offers many benefits to the institution as well as to the medical students. It represents a potential resource–saving measure because it can alleviate faculty teaching burden and enable students to learn the basic skills of medical education and encourages their development as teachers. Once medical students become doctors, they will have an important role in teaching. As medical practitioners and educators, they will be expected to supervise, teach, facilitate, assess and provide feedback to colleagues and to contribute to the learning of future generations of students. Peer teaching can therefore help them to develop the skills of teaching that are vital for all doctors to possess, and increase their own clinical knowledge and other professional skills. It can also promote an interest in an academic career (1–4).

Peer teaching can be beneficial to address specific gaps within the curriculum, such as anatomy, clinical skills, examination preparation and procedural workplace skills. It provides a safe space for practice and reinforcement of curriculum content and it fosters a sense of community among junior and senior peers, therefore providing an additional support in preparation for assessments (1, 3–5).

Different assessment tools have been developed along with the progress of medical education. One of them is objective structured clinical examination (OSCE) that was first introduced by Harden et al., and has been described as the gold standard for assessment of clinical competence (6, 7). In OSCE, the variables and complexity of the examination are more easily controlled; its aims can be more clearly defined; and more of the students' knowledge can be tested. The examination is more objective and a marking strategy can be decided in advance. The examination results in improved feedback to students and staff (6). Many of the benefits of OSCE are therefore related to its feasibility, flexibility and adaptability. Researchers have confirmed that OSCE, although stressful, is acceptable to students and better received than many other types of examination (7).

PEER TEACHING AT THE FACULTY OF MEDICINE, UNIVERSITY OF MARIBOR

The Faculty of Medicine, University of Maribor, Slovenia is among the youngest medical faculties in Europe. It was founded in October 2003, and the first generation of medical students enrolled in the academic year 2004/2005. Peer teaching as a form of medical education started in 2008/2009, when general peer–assisted learning for 1st and 2nd–year medical students was established. Two years later, the Faculty acquired its own Clinical Skills Laboratory and Simulation Centre, which enabled the development of clinical skills teaching through an elective course of selected topics and novelties in propaedeutics, which was introduced to 3rd–year students. In September 2010, the first eight clinical skills peer tutors started to prepare for the semester–long course, in which they taught 3rd–year medical students some basic clinical skills, for example, venepuncture, bladder catheterisation and infusion set–up. The protocols for the clinical skills that were intended to be taught were prepared and the course started in October 2010. In addition to the clinical skills, students were also taught how to take medical history and how to perform some basic clinical examinations. Before the academic year 2010/2011, the latter skills were acquired on wards only, with the help of clinical teachers. During the course, students started to practice even before they met the patients, because they were learning how to perform an examination on each other with the help of peer tutors and under the supervision of clinical teachers.

Soon, the quality and usefulness of the course were acknowledged and recognised by the first students that took part in it. The interest in the course, which was intended for a limited number of students only, started to grow and in the following years, increasing numbers of students applied (Table 1).

Recognition of the quality of peer teaching enabled the incorporation of peer teaching of focused physical examinations into regular curricula. In 2012, obligato-

Table 1. *Number of students and peer tutors involved in the elective course in different academic years.*

ACADEMIC YEAR	NUMBER OF STUDENTS	NUMBER OF CLINICAL SKILLS PEER TUTORS
2010/2011	17	8
2011/2012	40	13
2012/2013	40	20
2013/2014*	63	26
2014/2015	40	26
2015/2016	40	26

**a failure of the system to block the applications*

ry 18–hour propaedeutics clinical skills training held by peer tutors was introduced to all 3rd–year medical students. Since then, in the 1st month of the study, all 3rd–year students have been taught medical history taking and clinical examination through simulations and peer–assisted learning. After passing the OSCE, this training is followed by clinical practice with clinical teachers on wards.

With the purpose of offering the opportunity to learn the basic clinical skills to all 3rd–year medical students, in the academic year 2012/2013, basic clinical skills seminars were introduced to the internal medicine curriculum (Table 2).

As the interest in basic clinical skills teaching increased, clinical skills peer tutors also started to deliver short courses for 1st and 2nd–year medical students; mostly as a link to the general peer teaching that they already had. In addition to that, clinical skills peer tutors organised clinical skills workshops for 6th–year medical students before they started their clinical practice on the wards. These workshops also became a part of the internal medicine curriculum for 6th–year students.

EDUCATION OF CLINICAL SKILLS PEER TUTORS

Before the start of the course, peer tutors have to undergo an additional education programme, which prepares them for their work with students. The first educational programme was carried out in September 2010, just before the start of the elective course of selected topics and novelties in propaedeutics. In the 3–day–long educational programme, peer tutors were given the opportunity to practice all the skills that they were going to teach under the supervision of clinical teachers from the hospital. Besides practising clinical skills, peer tutors also gained theoretical knowledge and some teaching skills that they needed to teach students successfully.

In the following years, with the growing numbers of participating students and the expansion of responsibilities of peer tutors, the educational programme started to change. The content of the programme was improved and the focus slightly changed. The purpose of the course was no longer just to perfect procedural explanations and performance by peer tutors, but also to teach the peer tutors how to be a teacher. There was more focus on improving the communication and teaching skills of peer tutors. They started to learn more about how to motivate students, how to manage time schedules during the course and how to make the course effective for all the participating students, regardless of their prior knowledge. This shift was possible due to the experiences of the senior peer tutors and feedback of the first participating students. Senior peer tutors learned what could be improved in order to avoid the difficulties that they themselves faced during their classes with students, and their insights into the educational programme were fundamental to its renewal.

In 2014, obligatory OSCE for peer tutors was introduced to the educational programme. All peer tutors were asked to participate to confirm that they were competent in performing the skills that they were going to teach. Obligatory OSCE helped to point out the parts of the protocols that needed further explanations, and the following discussion focused on those topics. One of the important changes in the educational programme was the introduction of small working groups. A senior peer tutor was assigned to a group of three junior peer tutors. Together, they went through all the procedures, and the junior peer

Table 2. *Development of clinical skills peer teaching.*

ACADEMIC YEAR	SUBJECT (3rd year medical students)		CLINICAL SKILLS
2010/2011 2011/2012	Selected topics and novelties in propaedeutics		Medical history taking, examination of cardiovascular and respiratory systems, abdomen and locomotor system. Blood pressure measurement, rectal examination, venepuncture, infusion set-up, basic life support, bladder catheterisation, basic abdominal ultrasound, recognition of pathologic heart and respiratory sounds.
2012/2013	Selected topics and novelties in propaedeutics		Blood pressure measurement, rectal examination, venepuncture, infusion set-up, basic life support, bladder catheterisation, basic abdominal ultrasound, application of subcutaneous and intramuscular injection, venous cannula placement, arterial blood withdrawal, recognition of pathologic heart and respiratory sounds.
	Internal medicine	Practice	Medical history taking, examination of cardiovascular and respiratory systems, abdomen and locomotor system.
2013/2014 2014/2015	Selected topics and novelties in propaedeutics		Blood pressure measurement, rectal examination, venepuncture, infusion set-up, basic life support, bladder catheterisation, basic abdominal ultrasound, application of subcutaneous and intramuscular injection, venous cannula placement, arterial blood withdrawal, recognition of pathologic heart and respiratory sounds.
	Internal medicine	Practice	Medical history taking, examination of cardiovascular and respiratory systems, abdomen and locomotor system.
		Seminars	Venepuncture, rectal examination, infusion set-up, blood pressure measurement, recognition of pathologic heart and respiratory sounds.
2015/2016	Selected topics and novelties in propaedeutics		Blood pressure measurement, rectal examination, venepuncture, infusion set-up, basic life support, bladder catheterisation, basic abdominal ultrasound, application of subcutaneous and intramuscular injection, venous cannula placement, arterial blood withdrawal, recognition of pathologic heart and respiratory sounds.
	Internal medicine	Practice	Medical history taking, examination of cardiovascular and respiratory systems, abdomen and locomotor system.
		Seminars	Venepuncture, rectal examination, infusion set-up, blood pressure measurement, recognition of pathologic heart and respiratory sounds.
	Surgery	Practice	Operative field preparation, sterile glowing and gowning.

tutors learned how to observe, give feedback to the students, and manage the theoretical introductions. Educational programmes were also expanded by training in students' assessment. The concept of OSCE was explained, and peer tutors were given a chance to try themselves out as assessors.

Since the beginning, every part of the educational programme (Table 3), the discussions and work in small groups have been supervised by clinical teachers to ensure that the peer tutors are competent enough to run the course adequately.

ASSESSMENT OF THE STUDENTS

With the implementation of clinical skills peer teaching, the new method of assessment, OSCE, was also introduced. OSCE was initially carried out after the first part of the elective course on selected topics and novelties in propaedeutics in November 2010 (Table 4). Since then, OSCE has become an assessment tool for elective courses as well as internal medicine practical sessions. With OSCE, students are assessed by peer tutors. To ensure that the students thoroughly learn all the skills, the tested skills are not known in advance; not even to the peer tutors. The content of

Table 3. *An example of one day of educational programme.*

TIME	CONTENT
8.00 – 8.15	Introduction to the educational programme
8.15 – 10.15	MEDICAL HISTORY TAKING Theoretical introduction Practical example: clinical teacher plays a patient; peer tutor takes history; discussion. Small working groups: training of medical history taking and teaching
10.15 – 10.35	Peer tutor OSCE evaluation – medical history taking; discussion
10.35 – 11.00	Break
11.00 – 13.00	CARDIOVASCULAR EXAMINATION Theoretical introduction Practical example: clinical teacher observes an examination performed by one of peer tutors; discussion. Small working groups: training of cardiovascular examination and teaching of the protocol; discussion.
13.00 – 13.30	Peer tutor OSCE evaluation – cardiovascular examination; discussion
13.30 – 14.30	Lunch break
14.30 – 15.00	ASSESSMENT TRAINING – medical history taking and cardiovascular examination Three large groups formation. Senior peer tutors demonstrate protocols; junior peer tutors assess them using OSCE.
15.00 – 16.00	COURSE SIMULATION – medical history taking and cardiovascular examination Small working groups: 30 min for theoretical introduction preparation; real time simulation by some groups.

OSCE is known only to the head of the peer tutors and to the head teacher of the elective course. Peer tutors are assigned their stations just 30 minutes prior to the assessment and are therefore not able to transfer any information to the students.

The overall experience with clinical skills peer teaching and subsequent OSCE 1 year after their introduction was summarized by Kodela et al. (9). They presented OSCE results from the academic year 2011/2012 and compared them with the OSCE results from the previous year to establish whether the increased number of participating students affected the quality of work. They found that all of the participating students completed OSCE successfully. Comparison of results in the 1st and 2nd year showed no significant difference. They therefore concluded that peer tutors can successfully transfer clinical skills to their colleagues and that the increased number of participants did not affect the overall quality of clinical skills training (9).
It is important that the assessment system is fair and efficient. Therefore, senior peer tutors aim to evaluate the system frequently and to review the assessing competencies of all peer tutors. The first evaluation of peer tutors was carried out in the academic year 2011/2012; 1 year after the implementation of clinical skills peer teaching. The authors evaluated the ability of peer tutors to perform as OSCE assessors. They compared students' OSCE results for cardiovascular examination, blood pressure measurement and venepuncture when evaluated by peer tutors and medical doctors. They found that peer tutors were capable of objective and honest evaluation of students in OSCE because there was no significant difference between peer tutors and medical doctors in any of the evaluated procedures. They concluded that experienced peer tutors could be of great value to relieve the clinicians in OSCE evaluation (10).

Two years later, Zeme et al. aimed to establish whether there would be differences in assessment of the same performance by different peer tutors. They evaluated the competencies of OSCE assessors using filmed procedures of cardiovascular examination and intravenous cannulation. Peer tutors assessed filmed procedures using validated checklists. They found

Table 4. *Descriptive statistics for the first OSCE performance for students in 2011 (8).*

	Number of students	Minimum	Maximum	Mean	SD
Training attendance %	17	86	100	94.8	±5.4
Station 1: Bladder catheterisation – male: points (%)	17	24 (92)	26 (100)	25.8 (99.3)	±0.5 (2)
Station 2: Rectal examination – male: points (%)	17	16 (89)	18 (100)	17.8 (99)	±0.5 (2.9)
Station 3: Venepuncture: points (%)	17	19 (90.5)	21 (100)	20.2 (96.4)	±0.8 (3.6)
Station 4: Cardiovascular examination: points (%)	17	42 (88)	48 (100)	46.5 (96.6)	±2.1 (4.3)
Station 5: Infusion set–up: points (%)	17	21 (100)	21 (100)	21 (100)	0
Station 6: Blood pressure measurement: points (%)	17	10 (83)	12 (100)	11.4 (94.6)	±0.7 (5.9)
Station 7: Locomotor examination: points (%)	17	25 (83.3)	30 (100)	29.3 (97.5)	±1.3 (4.2)
Station 8: Abdominal ultrasound: points (%)	17	18 (90)	20 (100)	19.4 (96.9)	±0.7 (3.7)
Station 9: Abdominal examination: points (%)	17	19 (95)	20 (100)	19.4 (96.9)	±0.3 (3.7)
Station 10: Basic Life support: points (%)	17	13 (81)	16 (100)	15.2 (95.2)	±1 (6.5)

that 75.2% of results for cardiovascular examination and 78.2% for intravenous cannulation were within 1 standard deviation (SD), 21% and 15.1% within 2 SDs, and 3.8% and 6.8% were >2 SDs. Altogether, out of 21, there were seven rigorous assessors (11).

QUALITY CHECK–UPS

Since the implementation of clinical skills peer teaching, many smaller quality check–ups have been performed with the aim of assessing the work of peer tutors and the impact that their work has on students and their practice in clinical settings. So far, pilot studies at our faculty have confirmed that clinical skills teaching is more effective when peer tutors are involved (12); that repetitive practice improves students' OSCE results (13); that clinical skills teaching at our faculty is associated with high long–term clinical skills retention (14); and that students can successfully transform their simulator–acquired clinical skills into practice (15). Students who attended elective courses in 3rd year were able to perform a better physical examination on simulated patients in 6th year compared to those who did not attend these courses (16). Finally, our clinical teachers believe that clinical skills training contributed to better knowledge of propaedeutics in their medical students. They also agreed that simulation is an appropriate learning method for medical history taking; that examination protocols contribute to better performance; and that clinical skills training improves students' communication skills (17).

CONCLUSION

Nowadays, medical faculties aim to educate young doctors so that they fulfil seven key roles that are important to deliver effective healthcare to their patients and communities. The above–mentioned roles are medical expert, communicator, collaborator, manager, advocate, scholar and professional. The clinicians'

responsibilities as scholars are most readily applied to teaching activities. Clinicians have clear roles in taking scholarly approaches to their practice and demonstrating them to others (18,19).

Peer teaching represents an opportunity for medical schools to engage students as teachers. Early acquaintance with teaching enables students to learn how to teach and helps them to become competent clinical teachers, as good clinical teaching is important for good clinical practice (20).

Since its introduction, clinical skills peer teaching at the Faculty of Medicine, University of Maribor has been changing and improving. It started with the initiative of a few students, who were eager to improve the existing system and to contribute to the aims of the faculty to follow the current trends and advances in medical education. With the enthusiasm of students, support of professors, and with their common commitment they formed the grounds of today's system.

The scope of work of peer tutors is now expanding to the preclinical years. It is an important mission of following generations to maintain and further improve the current system, to continue the good work and to follow the novelties in medical education. With the support of professors and engagement of students, the programme will seek further opportunities to give their students quality studies and to enable them to become competent doctors and teachers.

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