

# Association between Clinical Experience in Trauma and the Objective Structured Clinical Examination (OSCE) Scores

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## Abstract

**Background/Objectives:** Medical students during their final year at Prince of Songkla University have an opportunity to be exposed to real clinical situations in a clinical clerkship. This study evaluates the number of trauma cases the medical students were exposed to during their final year before comprehensive examination, and determines the correlation between the number of cases and the examination scores.

**Methods:** A questionnaire was sent to final year medical students at the end of their rotations in the final semester. They were asked to report the number of trauma cases they were exposed to during the rotation. The Objective Structured Clinical Examination (OSCE) was done at the end of the rotation. The Spearman rank correlation was used to assess the association between the number of cases that they were exposed to and the OSCE scores in a trauma station.

**Results:** Of 176 students, 119 students responded to the questionnaires (68%). The median numbers of injured patients that the medical students were exposed to when they were at the university hospital and affiliated hospitals were 20 cases and 100 cases, respectively. The number of cases was not correlated with the communication skills assessment (rank correlation,  $r = -0.11$ ,  $p = 0.23$ ) or the medical performance (rank correlation,  $r = 0.0004$ ,  $p = 0.99$ ).

**Conclusions:** The number of trauma cases that the medical students were exposed to had no effect on the OSCE scores.

**Keywords:** OSCE, clinical experience, evaluation, education

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## INTRODUCITON

According to the framework proposed by George Miller, clinical competency develops from knowledge and leads to professional performance. “Know” is the assessment of knowledge, “know how” is the assessment of application of knowledge, “show how” is the assessment of the performance, and “do” is the assessment of action in a real situation<sup>1</sup>. The Objective Structured Clinical Examination (OSCE) is a tool that was invented for direct observation of “show how”.

Clinical experience results from learning in a clinical setting and is necessary for the development of medical students to be doctors<sup>2</sup>. However, there is weak correlation between clinical experience and test scores, including the OSCE score<sup>3-5</sup>.

The medical curriculum at Prince of Songkla University is a 6-year curriculum. It requires the final year medical students to have their clerkship in two hospitals: Six months at Prince of Songkla University Hospital and another six months at one of six affiliated hospitals, which are all referral centers. It is believed that working in the affiliated hospitals, which have higher volumes of trauma cases, tremendously enhances the performance of medical students. After finishing the six-month-rotation, the students undergo comprehensive examination.

This study aimed to evaluate the hypothesis that clinical experience enhanced the OSCE performance of the medical students. Students who had clinical clerkship at affiliated hospitals that had more clinical experience should therefore have better OSCE scores.

## METHODS

A questionnaire was given to final year medical students on the last day of the clerkship. The questionnaire asked for the number and characteristics of trauma cases that they experienced during the first six months, which included both observation and hands-on experience. The OSCE (Objective Structured Clinical Examination) which was a part of the comprehensive examination was done before the medical students changed their work place.

We assessed only the scores of the trauma station of the OSCE. The OSCE was divided into two parts. The first part aimed to assess the communication skills which accounted for 20% of the overall score. The second part aimed to assess the ability of the students

to manage trauma patients. The score in the chest trauma station in the OSCE was used in the analysis of the correlation between the number of cases and scores.

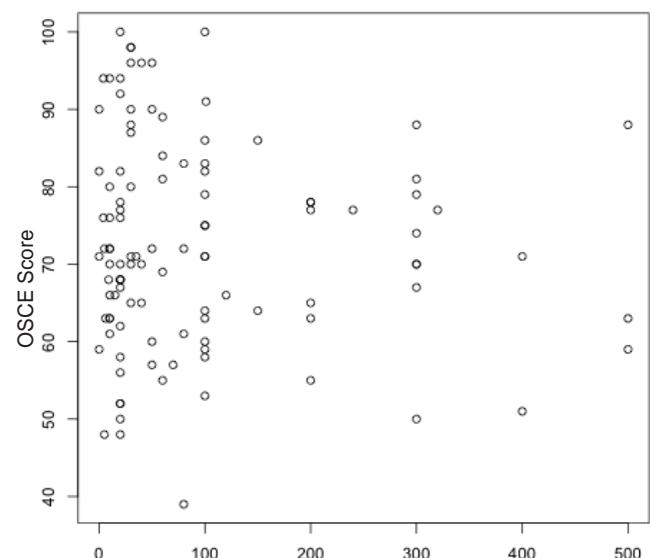
The Spearman rank correlation was used to measure the correlation between the number of cases and the OSCE scores. R version 2.14.16 and epicalc package<sup>7</sup> were used to analyze the data.

## RESULTS

The questionnaires were given to 176 medical students and 119 medical students returned the questionnaires. The response rate of the questionnaire was 67.61%. The ratio of male to female students was about 1:1. Fifty-four percent (64 students) of the medical students were working in the affiliated hospitals when the OSCE took place.

The median number of trauma cases experienced by the medical students in the affiliated hospitals was 100 cases (range, 35 to 200) before the OSCE test. This was much higher than the number of cases experienced by the medical students who worked in the university hospital, which was 20 cases (range, 10 to 60).

The correlation was tested and it was found that the number of cases was not significantly related to the



**Figure 1** Scatter plot showing the correlation between the number of trauma cases and the total OSCE score

communication skills assessment (rank correlation,  $r = -0.11$ ,  $p = 0.23$ ), or the medical performance score (rank correlation,  $r = 0.0004$ ,  $p = 0.99$ ).

There was no significant difference in the mean OSCE scores between the two groups of the students who worked in different workplaces (affiliated hospital 74.9 (SD, 13.5) vs. university hospital 70.6 (SD, 13.2),  $p = 0.09$ )

## DISCUSSION

The results of this study showed that the amount of clinical experience did not have an effect on the medical performance as assessed by the OSCE, which agreed with the results of a study by McManus et al.<sup>3</sup> that reported a lack of correlation between clinical experience and performance in the final examinations of the medical students in the United Kingdom. There are many possible explanations for these findings.

First, learner-related factors such as the learning style might be important. Martin et al.<sup>8</sup> conducted a study to explore the influence of the learning style and clinical experience on the OSCE performance, and found that learning style was associated with both the clinical experience and the OSCE results. However, clinical experience was not directly associated with the OSCE results. Some students with a certain learning style may not have a learning process when they experience the cases.

Second, the learning environment that the students experienced might be important. Even though final year medical students are exposed to trauma cases, they were under supervision of attending physicians and in critical situations like trauma, the students might only be observers. Being observers may not provide enough learning experience for the students, and this will therefore have no effect on the OSCE scores.

Last, a single trauma station of the OSCE might not validly assess the skills of the medical students. Therefore, the OSCE scores of a single station may not

reflect the true ability of the students.

One weakness of the present study is that the true number of trauma cases experienced by medical students is not known. The medical students responded from their memory and not from a written record of their experience.

## CONCLUSIONS

Clinical experience is not directly associated with the OSCE performance of medical students. However, the students who had their clerkship at an affiliated hospital were exposed to a higher number of trauma cases and had slightly higher OSCE scores.

## REFERENCES

1. Norcini JJ. Work based assessment. *BMJ* 2003;326:753-5.
2. Hay A, Smithson S, Mann K, et al. Medical students' reactions to an experience-based learning model of clinical education. *Perspect Med Educ* 2013;2:58-71.
3. McManus IC, Richards P, Winder BC, et al. Clinical experience, performance in final examinations, and learning style in medical students: prospective study. *BMJ* 1998;316:345-50.
4. Neumayer L, McNamara RM, Dayton M, et al. Does volume of patients seen in an outpatient setting impact test scores? *Am J Surg* 1998;175:511-4.
5. Châtenay M, Maguire T, Skakun E, et al. Does volume of clinical experience affect performance of clinical clerks on surgery exit examinations? *Am J Surg* 1996;172:366-72.
6. R Development Core Team. R: A language and environment for statistical computing. 2011 R Foundation for Statistical Computing; Vienna: Available from: <http://www.R-project.org/>.
7. Chongsuvatwong V. Epicalc: Epidemiological calculator. R package version 2.14.1.6.; 2012 [homepage on the internet] <http://CRAN.R-project.org/package=epicalc>
8. Martin IG, Stark P, Jolly B. Benefiting from clinical experience: the influence of learning style and clinical experience on performance in an undergraduate objective structured clinical examination. *Med Educ* 2000;34:530-4.

**บทคัดย่อ**      **ความสัมพันธ์ระหว่างประสบการณ์ทางคลินิกในการดูแลผู้ป่วยอุบัติเหตุและผลการสอบ OSCE**  
**ไอศรี อัครบวร, ชนันท กงกมล, กลอยใจ คำคง**

สาขาศัลยศาสตร์อุบัติเหตุ ภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์ มหาวิทยาลัยสงขลานครินทร์

**ที่มาและความสำคัญ:** ในขณะที่ศึกษาในชั้นปีที่ 6 นักศึกษาแพทย์คณะแพทยศาสตร์ มหาวิทยาลัยสงขลานครินทร์ จะได้ฝึกปฏิบัติงานโดยเป็นส่วนหนึ่งของทีมรักษา การศึกษานี้มีวัตถุประสงค์ที่จะศึกษาถึงความสัมพันธ์ระหว่างประสบการณ์ทางคลินิก ซึ่งประเมินจากจำนวนผู้ป่วยที่นักศึกษาแพทย์ได้มีส่วนร่วมในการดูแลและคะแนนสอบภาคปฏิบัติ

**วัตถุประสงค์และวิธีการ:** นักศึกษาแพทย์ชั้นปีที่ 6 ได้ตอบแบบสอบถามเมื่อจบหลักสูตร โดยแบบสอบถามได้ถามถึงจำนวนและลักษณะผู้ป่วยอุบัติเหตุที่ได้มีส่วนร่วมในการดูแลรักษา ทั้งในช่วงปฏิบัติในโรงพยาบาลสงขลานครินทร์และในโรงพยาบาลสมทบ การสอบปฏิบัติ Objective Structured Clinical Examination (OSCE) ทำในระหว่างภาคการศึกษาซึ่งมีนักศึกษาส่วนหนึ่งปฏิบัติงานในโรงพยาบาลสงขลานครินทร์และอีกส่วนหนึ่งปฏิบัติงานในโรงพยาบาลสมทบ จากนั้นคำนวณความสัมพันธ์ระหว่างจำนวนผู้ป่วยที่นักศึกษาได้สัมผัสกับคะแนนสอบปฏิบัติ OSCE ในฐานผู้ป่วยอุบัติเหตุ

**ผลการศึกษา:** นักศึกษาแพทย์ 119 คนจากทั้งหมด 176 คนได้ตอบแบบสอบถาม คิดเป็นร้อยละ 68 จำนวนผู้ป่วยที่นักศึกษาได้มีส่วนร่วมในการดูแลเป็น 20 รายในกลุ่มที่ปฏิบัติงานในโรงพยาบาลสงขลานครินทร์และ 100 รายในกลุ่มที่ปฏิบัติงานในโรงพยาบาลสมทบ จำนวนผู้ป่วยที่นักศึกษาได้มีประสบการณ์ในการดูแลรักษาไม่มีความสัมพันธ์กับคะแนนสอบปฏิบัติ OSCE ทั้งในส่วนที่ประเมินทักษะการสื่อสารและในส่วนของความรู้ด้านการแพทย์

**สรุป:** ประสบการณ์ทางคลินิกในแง่ปริมาณผู้ป่วยที่นักศึกษาแพทย์ได้สัมผัส ไม่สัมพันธ์กับคะแนนสอบปฏิบัติ OSCE