

Effectiveness of Direct Observation and Supervision at Out-Patient Setting on Improving Clinical Skills of Medical Students

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Background: Direct observation and supervision (DOS) is the teaching method where a mentor provides direct observation during patient encounter and provides feedback to the learner in real-time manner. Previous studies showed that DOS improves patient care and trainees' clinical skill but is difficult to implement.

Objective: To evaluate students' performance and attitude after implementing DOS to the 5th year medical students.

Material and Method: DOS was introduced for the whole class of the 5th year medical students throughout the year at out-patient setting department of Medicine, Siriraj Hospital in 2012. DOS sessions were provided during the first few patients' encounters. Students' performances at out-patients clinics were rated for other 8 subsequence sessions. The average score were compared to the 5th year medical students in 2011 (Conventional technique, CT).

Results: Two hundred and forty six students were supervised in DOS group. The mean score of students who received DOS was significantly higher than CT group with the score of 8.2 compared to 7.9, respectively ($p < 0.001$). With respect to students' satisfaction, 75% of students rated DOS as a learning method with high to very high benefit.

Conclusion: DOS method is feasible to implement and could improve student's performance with good satisfaction from medical students.

Keyword: Direct observation, Clinical skills, Medical students

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Providing direct observation and supervision (DOS) for medical trainees during their clinical encounters would be an ideal teaching method for evaluating clinical skill and provide feedback among trainees. This evaluation process will allow assessors to determine the performance of trainees when they approach patients which would be fairly similar to real practice in their future career⁽¹⁾. It is the venue where teachers would have the opportunity to observe students to 'show how' to integrate their knowledge. This could be accounted as the highest level of evaluation, according to Miller's pyramid of assessment⁽²⁾, that would be possible in medical schools. Moreover, it has also been suggested that direct observation in medical training would help for enhancing trainees' communication skill which is one of the crucial skill for medical practitioners⁽³⁾. The Miller's pyramid of assessment is shown in Fig. 1.

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Direct observation could be carried out by various means in different clinical environments. Several nomenclatures were used for the task of providing observations to trainees, both with or without providing feedback. Clinical evaluation exercise (CEX) and mini-clinical evaluation exercise (mini-CEX) are two examples of direct supervision which have the component of providing feedback and have been increasingly utilized in many medical schools for different level of learners⁽⁴⁾.

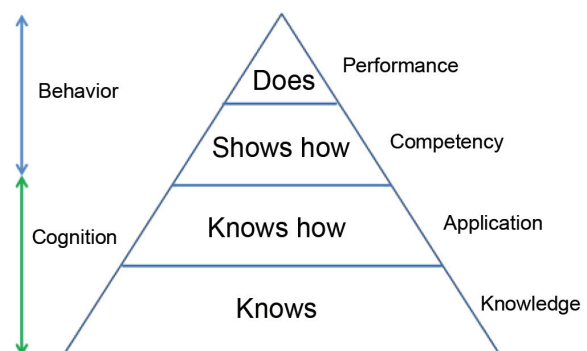


Fig. 1 Miller's pyramid of assessment.

In spite of DOS being a critical process in evaluating medical trainees during their clinical rotations, several studies have demonstrated that it has been underused by faculties in medical school throughout many regions worldwide^(1,5,6). A recent guideline for medical school in US called for increasing direct observation of trainees in order to assess data gathering, clinical reasoning and patient management skill⁽⁷⁾.

Siriraj Hospital is the largest medical school in Thailand with approximately three hundred medical students per each academic year. Outpatient encounter is one the activities arranged for medical students in internal medicine rotation in order to enhance their skill when approach ambulatory patients. This has always been carried out under supervision of attending physicians. Direct observation of medical students while taking history and performing physical examination have been, however, only limitedly carried out by the faculties.

Concerning of the importance of proper evaluation and providing feedback for medical students, direct observation and supervision (DOS) was therefore arranged for medical students in department of medicine, Siriraj hospital. In academic year 2012, DOS was implemented at outpatient setting for the whole class of 5th year medical students. This study aimed to investigate benefit of DOS on student performances and their satisfaction with the learning activity.

Material and Method

Study design

The present study was an analysis of students' performance after learning under DOS compared to historical control of student as studied under the conventional method. Additionally, the authors also analyzed student satisfaction after attending the program.

Conventionally, studying at outpatient clinic for 5th year medical students in Department of Medicine, Siriraj hospital would be carried out by having 3-4 medical students under supervision of one attending physician for a 3-hour period. Each medical student would attend outpatient clinics around 9-10 sessions per rotation and see 2 new patients per each session. All academic consultants in the department, which comprised of nearly 100 internists, was arranged to teach 5th year medical students at outpatient setting. Each consultant would provide approximately 7-8 teaching sessions per each academic

year. For every patient, medical students would independently take medical history and perform physical examination. They subsequently presented the finding to attending physicians who would confirm some of these findings as necessary and then discussion with student, in order to reach the diagnosis then prescribe appropriate management for each patient. Students' performance was evaluated after each outpatient session by the attending physicians. The score was given for their performances according to the following rating scale; 10 = excellent, 8-9 = good, 6-7 = average, 5 or less = below average. The component of performances evaluated in the rating score was shown in Appendix 1.

With the conventional technique (CT), it was difficult to know how much supervision was provided during the process of patient interview and physical examination. In order to ascertain adequate provision of students' clinical skill during interviewing patient and performing physical examination, direct observation and supervision (DOS) was therefore introduced. It was implemented at an out-patient setting for the 5th year medical students throughout the academic year at Department of Medicine, Faculty of Medicine Siriraj Hospital in 2012.

DOS in the present study was carried out by having faculties provide direct observation for medical students from the beginning of their patient encounters. The supervision would include clinical skills such as history taking and physical examination. This would followed by the process of discussing differential diagnosis and a plan of management. Feedback could be provided for the whole process at appropriate times during the session. The student who had direct observation would see only 1 new patient for that particular session. The other part of the outpatient sessions such as the number of students per group, the random arrangement of all academic physicians from the department and criteria for selecting cases for students; were organized in the same manner as the previous year.

Students' performance at out-patient clinics for the 2012 academic year were evaluated using scores from the subsequent 8 sessions at outpatient clinic which were rated by different instructors. The average score of this group (DOS) of medical students was then compared to the 5th year medical students in 2011 who learned at outpatient clinics with CT. The scoring system was similar between 2011 and 2012 and we have utilized the same group of instructors who supervised the medical students.

Student satisfaction ratings were collected from all students at the end of their rotation at department of medicine. The questionnaire was made anonymous in order to provide students confidentiality for their feedback. The students were asked to rate the benefit of the DOS program using liker scale. The scale of earning benefit from the learning activity ranges from 1-4 which were very little benefit, somewhat beneficial, substantial benefit and highly beneficial, respectively. Additionally, space was provided for students to provide additional comments as they wish.

Statistical analysis

The student t-test (one-sample t-test) was used to compare continuous variables. A *p*-value of less than 0.05 was set as statistically significant. All data were analyzed using the Statistical Package for the Social Sciences (SPSS) 18.0 for Windows.

Results

A total of two hundred and forty six medical students were included in the DOS group while students in CT group comprised of two hundred and twenty six medical students. Both groups had similar grade point average (GPA) from 1st year to 4th year (Table 1). The mean score from OPD sessions of

students from DOS group was significantly higher than CT group (8.2 compared to 7.9, respectively; *p*<0.001). When considering in detail the scores earned between 2 groups, both total score and score from laboratory examination also showed meaningful differences with statistically significance (Table 2). Average score rated for DOS and other OPD sessions were similar (8.13 and 8.18, *p* = 0.37).

Most of the medical students showed good satisfaction with DOS style of learning. Seventy five percent of students rated DOS as a learning method with high benefit (rated 3 or 4 on the most like scale). It was ranked as the third most beneficial learning experiences during their 5th year rotation in internal medicine. A number of students showed very positive feedback about this method of learning by expressing that they appreciated the supervision and feedback received. They addressed the factor that DOS might take a significant amount of time compared to CT but they did appreciate the merit of having direct feedback which would be helpful to improve their performance when encounter patients. Nevertheless, many have stressed some limitations of the method, mostly related to variations in character and attitudes of the supervisors leading to differences in scores they earned or negative feedback they received.

Table 1. Baseline characteristics of students in direct observation and supervision (DOS) group and conventional technique (CT) group

	CT group, mean (± SD)	DOS group, mean (± SD)	<i>p</i> -value
Number	226	246	NA
1 st to 4 th year grade point average (GPA)	3.39 (±0.34)	3.36 (±0.38)	0.186
Total score (0-100)	74.3 (±4.05)	75.1 (±3.53)	0.01
OPD score (0-10)	7.9 (±0.59)	8.2 (±0.50)	<0.001

NA = not applicable; OPD = outpatient department

Table 2. Details of evaluation scores comparing between 2 groups of students

Detail of scores from different type of evaluation	CT group, mean (± SD)	DOS group, mean (± SD)	<i>p</i> -value
Ward evaluation (0-20)	16.6 (±0.79)	16.5 (±0.68)	0.16
Preceptor evaluation (0-15)	12.4 (±1.01)	12.7 (±0.83)	0.01
Patient report (0-5)	3.9 (±0.57)	4.0 (±0.51)	0.16
Bedside teaching (0-5)	4.2 (±0.16)	4.1 (±0.18)	0.01
Long case examination (0-10)	8.1 (±0.83)	8.1 (±0.64)	0.98
MEQ examination (0-20)	11.8 (±1.37)	11.8 (±1.34)	0.55
Lab examination (0-10)	5.2 (±0.96)	5.5 (±0.85)	<0.001
Evaluation at outpatient clinic (0-10)	7.9 (±0.59)	8.2 (±0.50)	<0.001

MEQ = modified essay question

Discussion

The present study has demonstrated that providing direct observation and giving feedback in DOS method is beneficial for medical students by improving their clinical performance. It was shown that their subsequent encounters with other patients were better than their comparator (CT group) who had a similar baseline performance. The scores earned for subsequent encounters were marked by different instructors in the department for each visit which reaffirmed that the higher scores would have come from their genuinely better clinical performances, not just familiarity to raters' scoring pattern. The present study harmonizes with previous studies that showed benefits of DOS^(5,8,9). Nevertheless, previous studies have not assessed directly students' clinical performance as does the present study. The present study has affirmed that, apart from the benefit of providing guidance and feedback to trainees, this method has further improved their clinical skill. This additive beneficial effect would have stemmed from providing feedback from limitations directly observed as other arrangements during the learning sessions were similar compared between DOS and CT groups. DOS could therefore be both a method that the teacher could perform better evaluation of students' limitation and subsequent provide relevant feedback to guide students to improve their skill.

When exploring in detail the scores earned by DOS group, some aspects were worth mentioning. Two other domains of score that were meaningfully higher in DOS group were preceptor evaluation and laboratory examination. When considering scores in the entire evaluation in the present study, one would have thought that domains which were related to clinical skill should have been long case exam and probably preceptor evaluation. These 2 evaluations were performed by a single assessor while long case exam had one exposure and preceptor had multiple exposures between students and teachers. Therefore, preceptor evaluation might give a better insight of student's clinical performances. Considering that DOS group had one other aspect of clinical skill better than their comparator, this could have been, to some extent, attributable to the effect of DOS technique. It is also possible that the group had better clinical performance at the outset but this could have been less likely providing they have similar overall performance from previous years. It is difficult to explain the correlation between DOS and the observed better score from laboratory examination in the present study. The

laboratory examination aimed to evaluate students' skill in interpreting investigation results which might not be a direct result of DOS. The difference could have occurred by chance.

With respect to learners' satisfaction, a majority of the students were satisfied with DOS and ranked it as a very beneficial method of learning for the internal medicine rotation. The high students' satisfaction with this method was in accordance with previous studies⁽¹⁰⁻¹²⁾.

Additional free comments from students in the present study have also been reassuring that the technique is beneficial. A number of them appreciated the lessons learnt and feedback received and even enquired about receiving more feedback and having more sessions. Although some concerns were raised with respect to time consumed with DOS technique, previous study³ has surveyed this and found no effect on time spent. The present study did not directly collect data in this matter but assumed that it was minimally affected as the consultants who remained supervised a similar number of students compared to previous year in CT group.

The present study has proven that implementation of DOS in a large group of study throughout the academic year is feasible. Our institute is the largest medical school in Thailand where we receive more than 250 new medical students per year and the number is increasing. It was possible to conduct this method for the class regularly throughout academic year was the result of the decision to make this arrangement to be a policy and embedded it in the routine teaching sessions. The students might see fewer cases but might gain more clinical skill with receiving feedback. The main concerns of the faculties were in relation to benefit earned by the learners within this somewhat pressured environment, while being observed during the whole process. This study has proven its benefit and we have, therefore, continued to provide DOS at 5th year OPD sessions. It would be ideal if such direct observation could be implemented in other settings as efficiently as the present study.

The present study has a number of limitations. Firstly, the benefit observed did not originate from a randomized controlled study and there could be some confounding factors. However, the authors believe that it might not be appropriate to conduct a randomized study in this context, for learners might not receive similar benefits if they were in an unsupervised arm. The historical control group was in the same curriculum; many factors, including evaluation processes and

assessors in the program, could have been fairly similar and confounding factors would have been minimal. Secondly, the benefit of the program was shown in trainees' performance, which might not have been optimum. It would have been more beneficial if we could prove that the benefit of this technique could be sustained beyond training into their clinical practice. It might be an ideal if the direct observation technique could have been carried out by medical teachers more often and involved in several clinical contexts.

Conclusion

DOS can improve medical student's performance with high satisfaction in out-patient setting. It also is feasible to carry out for a large group of medical students by more than 100 instructors from the department of internal medicine.

What is already known on this topic?

We believe that DOS method may lead medical students to improve their clinical skills at OPD setting.

What this study adds?

This study shows effects of DOS on medical students to improve their skills after implementing the method.

Acknowledgement

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Potential conflicts of interest

None.

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Appendix 1. Scoring scale for evaluating medical student at out-patient clinic

Evaluation items	Excellent (10)	Good (8-9)	Average (6-7)	Below average (≤ 5)
1. History taking (20%)				
- Communication skill and manner (5%)				
- Completeness of history taken (15%)				
2. Physical examination (40%)				
- Performance (20%)				
- Accuracy (20%)				
3. Discussion (30%)				
- Presentation of gathered information (10%)				
- Problem list (5%)				
- Differential diagnosis (10%)				
- Final diagnosis (5%)				
4. Plan of management (10%)				

ประสิทธิภาพของการเฝ้าสังเกตและให้คำแนะนำโดยตรงที่แผนกผู้ป่วยนอกสามารถพัฒนาทักษะทางคลินิกของนักศึกษาแพทย์ได้

ชัยวัฒน์ วชิรศักดิ์ศิริ, ปวีณา เชี่ยวชาญวิศวกิจ, กฤตยา กอไพศาล, รณิษฐา รัตนะรัต, วราลักษณ์ ศรีรินทร์ประเสริฐ

ภูมิหลัง: การสอนโดยการเฝ้าสังเกตและให้คำแนะนำโดยตรงคือ การที่อาจารย์ได้เฝ้าสังเกตและให้คำแนะนำแก่นักศึกษาโดยตรงในขณะที่ปฏิบัติงาน จากการศึกษาก่อนหน้านี้แสดงให้เห็นว่าการเฝ้าสังเกตและให้คำแนะนำโดยตรงสามารถเพิ่มความสามารถในการดูแลผู้ป่วยและทักษะทางคลินิกของนักศึกษาได้ แต่การจะจัดให้เกิดขึ้นนั้นมีความยากลำบาก

วัตถุประสงค์: เพื่อประเมินความสามารถในแสดงออกและทัศนคติของนักศึกษาแพทย์ชั้นปีที่ 5 หลังจากที่ได้นำวิธีการเรียนรู้ด้วยการเฝ้าสังเกต และให้คำแนะนำโดยตรงมาใช้

วัสดุและวิธีการ: นำวิธีการเฝ้าสังเกตและให้คำแนะนำโดยตรงมาใช้กับนักศึกษาแพทย์ปี 5 ทั้งหมด ที่แผนกผู้ป่วยนอกของภาควิชาอายุรศาสตร์ โรงพยาบาลศิริราช ใน พ.ศ. 2555 โดยการเรียนรู้ด้วยการเฝ้าสังเกตและให้คำแนะนำโดยตรงนั้นจะทำเพียงเฉพาะกับผู้ป่วย 1-2 รายแรกที่มีการตรวจเท่านั้น การแสดงทักษะทางคลินิกของนักศึกษาแพทย์ที่แผนกผู้ป่วยนอกนั้นจะได้รับการให้คะแนนทั้งหมด 8 ครั้ง ต่อเนื่องกัน คะแนนเฉลี่ยที่ได้จะนำมาเปรียบเทียบกับคะแนนเฉลี่ยจากนักศึกษาแพทย์ชั้นปีที่ 5 ในปีการศึกษา พ.ศ. 2554 ที่ได้รับการเรียนรู้แบบเดิม

ผลการศึกษา: นักศึกษาจำนวน 246 คน ที่ได้รับการดูแลเรียนรู้ในระบบเรียนรู้ด้วยการเฝ้าสังเกตและให้คำแนะนำโดยตรง คะแนนเฉลี่ยของนักศึกษาที่ได้รับการเรียนรู้ด้วยการเฝ้าสังเกตและให้คำแนะนำโดยตรงนั้นสูงกว่ากลุ่มที่ได้รับการเรียนรู้แบบเดิมอย่างมีนัยสำคัญทางสถิติ โดยคะแนนที่ได้คือ 8.2 คะแนน เทียบกับ 7.9 คะแนน ($p < 0.001$) โดยที่นักศึกษามีความพึงพอใจร้อยละ 75 ของนักศึกษาให้คะแนนว่าการเรียนรู้ด้วยการเฝ้าสังเกตและให้คำแนะนำโดยตรงมีประโยชน์มากถึงมากที่สุด

สรุป: วิธีการเฝ้าสังเกตและให้คำแนะนำโดยตรงมีความเหมาะสมที่จะนำมาเพิ่มความสามารถในการแสดงออกทางทักษะทางคลินิกของนักศึกษาแพทย์ และนักศึกษาแพทย์มีความพึงพอใจเป็นอย่างมาก