An Analysis of the Effects of Internal Medicine Training before Clinical Practice Based on the OSCE

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Abstract. Objective: To explore a teaching mode that can improve medical students' clinical competence by internal training before clinical practice and an analysis of its effectiveness. Methods: According to the OSCE, eight-year medical students were trained in internal medicine, practiced repeatedly and were evaluated before entering clinical practice. The effect of this teaching mode was evaluated using questionnaires. Results: (1) There is statistical significance in the differences in the interrogation, physical examination and four major punctures in internal medicine before and after the training, P<0.05. (2) There are extremely good evaluations of actual work ability, interest in learning, satisfaction with the teaching mode, teaching effects and “whether they like it” in the questionnaire analysis. Of the participants, 93.72% rated this method as very good. Conclusion: Clearly, students improved their clinical competence by training before entering clinical practice. Students liked the manner of teaching, and this mode is worth disseminating widely.

Introduction

As society develops, people hope for better physical health and increased longevity, which require cultivating more and more high-quality medical students who will contribute to improving human health and the medical profession. Clinical medicine is a very practical discipline. Under the current education system in our country, medical education is more extensive than disciplines in other colleges. Because these students will be doctors after graduation, they must take numerous theory courses and engage in extensive practice before assuming the burden of healing the wounded and rescuing the dying by becoming a real doctor. These students have a year of clinical internship to lay the foundation for their ensuing jobs. Thus, it is quite important to cultivate medical students[1]. We engaged in teaching reform to explore a better and more practical teaching mode to help students grasp clinical work as soon as possible.

Materials and Methods

Research Subjects

A total of 37 people in an eight-year program of clinical medicine, beginning in 2011, were recruited in our hospital.

Methods

Clinical medical students who were soon to begin clinical internship were trained in doctor-patient communication, diagnostic thinking, conversation records, course records, the basic requirements for medical punctures, the basic program of medical clinical work, ECG analysis, imaging examinations and training in performing medical punctures, in accordance with the OSCE
assessment. The study then analyzed students' evaluation of this teaching mode using a questionnaire. We divided the students into two groups (the first group: before training; the second group: after training). We finished the experiment with a focus on hospital clinical skills according to the OSCE. SPs were taught in a strict and comprehensive program and passed the exam.

**Statistical Processing**

The data were analyzed by SPSS 17.0 software. If measurement data met the normality and homogeneity of variance, we used $\bar{x} \pm s$ and two-paired sample mean $t$ tests. If not, we used $M(Q_{1}~Q_{3})$ and paired sample rank and inspection. $P < 0.05$ was the level of statistical significance.

**Results**

**Effect Analysis**

**Inquisition:** Competencies before and after training were compared. There was no statistically significant difference, as shown in table 1.

<table>
<thead>
<tr>
<th>Group</th>
<th>Inquisition records (score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>73.60(65.80~78.30)</td>
</tr>
<tr>
<td>2</td>
<td>80.00(70.50~85.00)</td>
</tr>
<tr>
<td>$z$</td>
<td>-2.647</td>
</tr>
<tr>
<td>$P$</td>
<td>0.014</td>
</tr>
</tbody>
</table>

**Physical Examination:** Students were compared before and after training. The results after training were significantly higher than the pre-training results. The statistical difference is presented in table 2.

<table>
<thead>
<tr>
<th>Group</th>
<th>Records of physical examination (score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>66.70(41.12~74.00)</td>
</tr>
<tr>
<td>2</td>
<td>74.00(63.00~83.00)</td>
</tr>
<tr>
<td>$Z$</td>
<td>-2.406</td>
</tr>
<tr>
<td>$P$</td>
<td>0.016</td>
</tr>
</tbody>
</table>

**Puncture:** No student could complete an operation independently before training. After training, the average score was 86.5±11.8 points, and 35 students scored more than 75 points, accounting for 94.6%. The statistical significance is presented in table 3.

<table>
<thead>
<tr>
<th>Group</th>
<th>Records of puncture (score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40.21±3.3</td>
</tr>
<tr>
<td>2</td>
<td>86.5±7.8</td>
</tr>
<tr>
<td>$t$</td>
<td>-19.891</td>
</tr>
<tr>
<td>$P$</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Student Questionnaire Analysis

There were 35 effective questionnaires; 2 were invalid.

**Help with Practical Work Ability:** Twenty-one students rated the program as very helpful, and 14 rated it helpful, accounting for 60.0% and 40.0%. No help was scored as 0, as shown in figure 1.

![Figure 1](image1.png)

Figure 1. Assessment of the Helpfulness of the Program for Actual Work Ability.

**Interest in Learning.** Nineteen people rated the program as very interesting, accounting for 54.3%; 11 rated the program as interesting, accounting for 31.4%; and 5 rated the program as normal, accounting for 14.3%; the results are shown in figure 2.

![Figure 2](image2.png)

Figure 2. Evaluation of Interest in the Teaching mode.

**The Degree of Satisfaction with the Teaching Mode.** Eighteen students rated the teaching mode as very satisfactory, accounting for 51.4%; 15 rated the mode as satisfactory, accounting for 42.9%; and 2 students rated the teaching mode as normal, accounting for 5.7%; the results are shown in figure 3.
Teaching Effect. Twenty-one students rated the teaching effect as very good, and others rated the effect as good, accounting for 60.0% and 40.0%, respectively. No students rated the effect as normal. These results are presented in figure 4.

Whether Students Liked the New Teaching Mode. Seventeen of the students were very fond of the new teaching mode, accounting for 48.6%; 14 students were fond, accounting for 40.0%; and 4 students thought the mode was normal, accounting for 11.4%, as shown in figure 5.
The Expert Evaluation

It was agreed that the educational reform project would be established for medical students who were entering clinical practice. The purpose was to help students adapt to clinical work as soon as possible and to improve their ability to perform practical work. Classes that made up for skills the students had not learned during the early stages of the study were practical. Training students in inquisition and physical examination skills was very effective. The students’ basic operation skills had very obviously improved. The teaching mode was extremely significant and worth disseminating widely.

Conclusion

Traditional medical education patterns have played a positive role in cultivating medical talents in recent decades. However, with the gradual development of internationalization, the social medical model and the changes in people's health demands, the mode of advanced medical education faces constant updates and reform [2]. Professor Hutchinson Waters from America noted that teaching methods must include the objective requirements of society and education that are reflected in students' subjective needs in their minds [3].

Medicine is the most practical of subjects, and clinical practice is a significant component of a medical education. For students, practice is a special stage in which a mutual transformation occurs involving basic theory, basic knowledge and basic skills. Its effects directly reflect ethics, technical levels and responsibility for a professional career in the future. For medical colleges, practice results are the most important criteria reflecting the quality of teaching, examinations and education[4]. Clinical thinking is one of a doctor’s most important basic abilities, used in doctors’ clinical diagnoses and the treatment of disease. Although the importance of clinical thinking ability is not being questioned, there is a disparaging trend in current medical education. With the development and utilization of modern science and technology, clinical doctors’ practical abilities depends on their clinical thinking method in addition to their professional knowledge and clinical experience. Whether their thinking method is correct or not, clinical thinking is directly related to the growth of a doctor and medical quality[5]. Thus, we have strengthened clinical medicine training before medical students enter clinical practice.

Inquisition

Inquisition is a very important component of diagnostics, a major means of collecting a medical history, and each clinician must master these basic skills. The information gathered by inquisition is of great significance in understanding the occurrence and development of disease, diagnosis of the
disease, treatment, and previous health status. However, there are many problems in the actual teaching process, such as fewer sources and more internship students, the need to strengthen learning, and repeatedly inquiring about the history, which increases the mental burden on patients. Some diseases are obviously seasonal, and some patients are not compliant and do not cooperate. These phenomena have greatly influenced clinical teaching work and its effects[6]. An SP, or Simulated Patient, is a normal person or mildly ill patient who engages in the non-medical work following standardized and systematic training. Students can accurately assess the patient's clinical symptoms and signs, describe the patient's history and develop clinical inspectors. Using an SP is an opportunity for medical students to practice and train[7]. Training emphasizes doctor-patient communication skills. The inspection by an SP gives students a chance to simulate interacting with a real patient [8, 9]. The results were obviously improved following the training.

**Training to Conduct a Physical Examination**

As a qualified clinician, standardization of a physical examination must be mastered. Although the students have studied diagnosis, a system examination and physical examination should be combined with clinical practice. We invited professors with rich teaching experience to teach the students, demonstrating correct and incorrect skills. The students’ results on the physical examination clearly improved after training. There were significant differences.

**Four-puncture Training in Internal Medicine**

Pleural puncture, abdominal puncture, bone marrow puncture and lumbar puncture are extremely important in the processes of clinical diagnosis. The nature of the effusion is quite important for diagnosis and treatment of disease. Puncture is thus a basic skill that residents must master. Due to various restrictive conditions or students’ forgetting what they learned, the results of the examination were not ideal before training. If students had begun clinical work at that time, there would have been many difficulties. Therefore, we arranged some lectures regarding conversations with patients, indications, contraindications, preoperative preparation, intraoperative operation, postoperative operation and attention during the process. We conducted hands-on training and arranged to practice (teachers tutoring). The effects were obvious after training, according to the OSCE.

**Relevant Training for Clinical Requirements**

**Physician-Patient Communication:** Many doctor-patient problems are caused by poor communication. Inquisition skills are primarily emphasized in diagnostics teaching; therefore, we conducted training in doctor-patient communication and taught the students how to transform their role. The primary factors in the communication (patients, physicians, information, environment, etc.) were analyzed using examples.

**The Training of Diagnostic Thinking:** Students were required to combine their theoretical and clinical knowledge after entering the clinical field, involving a large number of diagnoses and differential diagnoses. Patient's conditions did not fall neatly into typical clinical manifestations of the disease and changed with the evolution of the illness. When a patient's tests could not be used to diagnose disease, we needed to consider what to do. Similar issues were included in the curriculum.

**The Specification Requirements for Medical Record and Progress Notes:** It was necessary to standardize and write practical medical records and progress notes. The details of training primarily included records of ward rounds for the students’ superiors, all types of conversation records and operation records, etc. These must be mastered after beginning clinical practice.

**Students were Trained in Other Areas,** such as basic working procedures, electrocardiogram (ECG), and medical image reading.

**The Questionnaire for Students**

During the entire training process, the teacher and the students displayed great enthusiasm. We researched five aspects related to training, the help regarding the actual work ability, interest in learning, satisfaction with the teaching mode, the teaching effect, and whether the students like this
method. The results demonstrated that the five aspects received a very good evaluation, accounting for approximately 93.72%.

**Supervision Experts and Teachers Gave Full Affirmation and Excellent Evaluations to the Project.**

This teaching mode strengthened diagnostic thinking, doctor-patient communication and medical records; the course specifically trained students in four basic medical operations of a physical examination. This method may also strengthen or compose the teaching content of diagnostics. Analyzing the students’ questionnaires indicated that the teaching mode was quite helpful and students were pleased by this method. Experts also gave the method a high evaluation. Therefore, this teaching mode is worthy of being extensively applied.

**References**


**Abbreviation**

OSCE  Objective Structure Clinical Examination  
ECG  Electrocardiogram  
SP  Standardized Patients  
SPSS  Statistical Product and Service Solutions