



## Designing Objective Structured Clinical Examination in Basic Community Pharmacy Clerkship Course and Assessment of Its Relationship with Conventional Exam

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### ABSTRACT

**Background:** Over 90% of pharmacy students' work in pharmacies after graduation which needs both knowledge and skill, thus one of the most essential courses of their education is pharmacy clerkship. An important part of an educational program is the evaluation of the trainees. Different studies show that conventional written exams are not successful in evaluating the skills of the students and can mostly evaluate their knowledge. Thus Objective Structured Clinical Examination (OSCE) is used to evaluate the students in different aspects.

**Methods:** An OSCE and a conventional test were given to a group of students at the end of basic community pharmacy clerkship course. The OSCE test consisted of six different stations (reading prescriptions, identifying drugs, pharmacist's recommendation, patient education, drug information resources, and drug usage instructions). Two questions were asked at each station by different examiners. The scores and results of these tests were compared and analyzed.

**Results:** There was no significant correlation between OSCE final scores and written test scores ( $P = 0.217$ ). No significant correlation between each station's score and the written test score was found.

**Conclusion:** The absence of significant correlation between OSCE and conventional exams shows that the skills evaluated by OSCE cannot be evaluated by the best possible written tests. This type of examination is not commonly used in Iran's pharmacy schools but due to the findings of this study, it seems that this multiform method, despite being more difficult to arrange, can be a more suitable and relevant way to evaluate basic community pharmacy clerkship compared to conventional written tests.

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### Introduction

At the beginning, modern pharmacy was founded for educating specialists in formulating and compounding

drugs. To this end, the pharmacy school was founded in 1930 to train expert human resources for formulating and compounding drugs (1). As industrial processes in drug manufacturing developed, the role of pharmacists also transformed from medicine compounders to those responsible for distribution and dispensing of drugs to patients, in a way that most of the pharmacists assumed the responsibility of medicine supply management by

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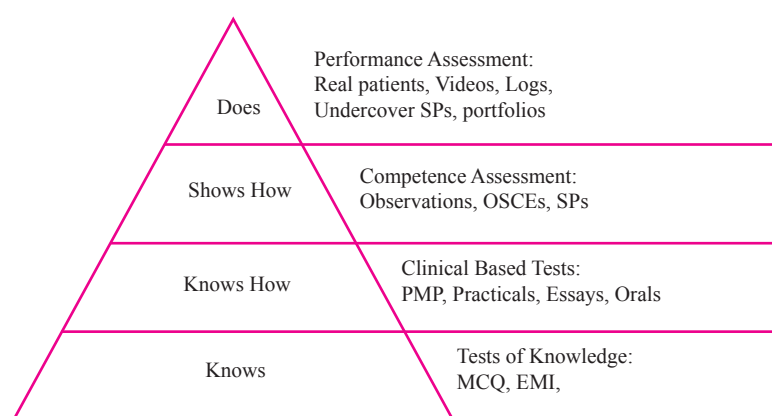


Figure 1. Miller hierarchy.

opening hospital and community pharmacies (2). As the concept of pharmaceutical care came into being, pharmacy transformed from the distribution of drugs to achieving therapeutic goals with the least side effects (3). Given the pharmaceutical care approach, pharmacists must be aware of clinical drug related issues and patient communication and not merely drug distribution. As a result, training content and evaluation methods should meet these needs. For this purpose, the pharmaceutical education programs were revised in 2005, and courses related to pharmacy and pharmaceutical care increased in terms of quantity and quality.

In view of the fact that over 90% of pharmacy students work in pharmacies after graduation, the most important part of their education are pharmacy clerkship (basic community pharmacy clerkship) and internship. In Iran's pharmacy curriculum, pharmacy clerkship is defined as the "courses in the real work environment presented to master practical skills." Basic community pharmacy clerkship is defined as "courses offered aiming at educating practical skills in the field of health care services" (4). The above courses in pharmacy education program are defined as a 2-credit basic community pharmacy clerkship and a 6-credit clerkship in pharmacy field. The main goal of pharmacy clerkship is for students to become familiar with common drug groups, reading prescriptions, resources of drug information and skills to answer the questions of patients and medical staff (5).

In most pharmacy schools, evaluating the clerkship course has been in the form of a written exam, an oral exam, or a combination of the both. But according to Miller hierarchy (Figure 1), written tests can only evaluate knowledge and oral exam can only evaluate know-hows. Thus, evaluating skills needs other methods (6). Therefore, considering the goal of internship in pharmacy, current exams are imprecise for testing basic clinical skills.

In order to evaluate the emotional-motor field, or in

other words "show how", the Objective Structured Clinical Examination (OSCE) is used (first introduced by Harden) (7). In this method, a number of stations each of which contains a clinical scenario are used. The interviewer's error rate decreases by this method and the reliability and validity of the test is increased (8). A research in the United States of America showed that there is no positive correlation between OSCE scores and written test; hence, adding OSCE scores to these tests can assess other fields like emotional-motor (9).

The Objective Structured Clinical Examination (OSCE) is long being used for testing clinical skills of medical students and can show medical and nursing students' clinical skills pretty well (10, 11). In many great pharmacy schools, this method is being widely used to evaluate the skills of pharmacy students. For example, an extensive study in USA indicated that 37% of pharmacy schools use the Objective Structured Clinical Examination (OSCE). In schools not performing this method, faculty members' lack of time was the reason (12).

Due to the importance of pharmacy clerkship in the education of pharmacy students, a standard method for evaluating pharmacy students' skills is required. Therefore, this study is conducted to test this method and comparing it with existing evaluation systems of pharmacy clerkship.

## Method

The research method is quasi-experimental. All of the pharmacy students of Ahvaz Jundishapur University of Medical Sciences who have taken basic community pharmacy clerkship course in the second semester of the academic year 2013-2014, participated in this study. An OSCE was designed to evaluate knowledge and skills of the students.

First, a review of Ahwaz School of Pharmacy's

**Table 1.** Significance of each OSCE station.

|                                                | Pearson Correlation | Significance |
|------------------------------------------------|---------------------|--------------|
| Identifying prescription items                 | -0.089              | 0.607        |
| Writing the usage instruction                  | -0.103              | 0.549        |
| Matching the prescription with the drugs given | 0.139               | 0.149        |
| Reading the prescription                       | -0.09               | 0.602        |
| Finding the brand names                        | -0.296              | 0.08         |
| Finding the indication                         | 0.10                | 0.945        |
| Total score                                    | -0.211              | 0.217        |

**Table 2.** Descriptive statistics of Objective Structured Clinical Examination (OSCE) stations.

|                                                | Mean | Standard Deviation | Maximum | Minimum | Number |
|------------------------------------------------|------|--------------------|---------|---------|--------|
| Identifying prescription items                 | 1.05 | 0.714              | 2       | 0.0     | 36     |
| Writing the usage instruction                  | 1.97 | 0.844              | 3       | 0.0     | 36     |
| Matching the prescription with the drugs given | 2.80 | 2.09               | 6       | 0.0     | 36     |
| Reading the prescription                       | 3.0  | 1.17               | 4       | 0.0     | 36     |
| Finding the brand names                        | 2.58 | 1.5                | 4       | 0.0     | 36     |
| Finding the indication                         | 1.5  | 1.59               | 4       | 0.0     | 36     |
| Total score                                    | 4.33 | 1.07               | 6.33    | 2.02    | 36     |

educational programs and national curriculum determined the necessary knowledge and skills for the course. Then, two tests were designed, one written and one OSCE. The OSCE had six stations:

1. Reading prescriptions of internal medicine, psychiatry, neurology, dermatology, and infectious diseases.
2. Naming the pharmacological and therapeutic groups and the usage of drugs in the prescriptions.
3. Computer-equipped station with drug information resources in order to assess students' skills in finding drugs' basic information (brand and generic names, pharmacological and therapeutic categories, etc.)
4. Controlling the prepared prescription with real drugs in it, in terms of number, type, and pharmaceutical form and correcting errors of prescription preparation.
5. Writing usage instructions and labeling of the drugs.
6. Patient education and pharmacist's advice on drug use.

Due to the limited number of clinical pharmacy instructors, three examiners were determined and each asked two questions. The students had five minutes to answer each question (10 minutes at each station). The

time was recorded by a stopwatch alarm. In order to prevent students from knowing the questions, there were several scenarios and multiple drug supplies with the same level of difficulty to be asked. A checklist containing three questions was given to the examiners for evaluating the students. A brief but precise explanation about the method of the exam, contents of the stations, and scores was given to the students prior to OSCE.

At the end, the relationship between Objective Structured Clinical Examination (OSCE) score and written test score was tested as well as score of each station was assessed via Pearson correlation.

### Results

36 students of the same class participated in this study and took OSCE and written exam. There was no significant correlation between OSCE final scores and written test scores ( $P:0.217$ ). Moreover, there was no significant correlation between each station's score and the written test score. The least score in the stations was drug information resources station and controlling the prescription. Table 1 shows the significance of each station as well as the Pearson correlation.

## Discussion

In order to evaluate the knowledge and skills necessary for pharmacy clerkship, Objective Structured Clinical Examination (OSCE) is commonly used (13, 14).

In this study, there was no significant correlation between scores of the OSCE stations and the written test or the OSCE total score and written test score. This finding is similar to those by Kirton and colleagues. The reason seems to be the fact that the skills evaluated by OSCE cannot be evaluated by the best possible written tests. It also seems that adding OSCE to the written test can evaluate other fields such as motor-motion (which is missed in a written test) (9).

The least acquired score belonged to controlling the prescriptions and finding the indication of usage by using drug information resources. This finding can be attributed to the need for further practical skills that should take place in a pharmacy and on field. The skill of reading the prescriptions can be trained without presence in pharmacy and only through practicing with sample prescriptions. Contrary to the case of usage search, the average score of finding trademarks was high due to limited resources and the need for fewer skills.

This study also confirms the results of another study in Malaysia in which pharmacy students believed that OSCE can show their skills in pharmacy pretty well (15). Unfortunately, this method is not commonly used in Iran to evaluate pharmacy clerkships. The only published study in Iran is a similar test called Objective Structured Field Examination (OSFE) which was used in Tabriz University of Medical Sciences, School of Pharmacy, to evaluate pharmacy clerkship. The results indicate students' high satisfaction and appropriate evaluation (16).

Considering the results of this study, the common use of OSCE can be proposed for evaluating pharmacy skills. It is recommended that OSCE be used as a supplement to the written test. This type of test can also be used in internship in pharmacy field because there are further skills in this test such as interpreting the prescription. As an example, another study indicated that using OSCE can be useful in evaluating the ability to establish a relationship with the patient in students (17, 18). In future, assessing the validity and reliability of the stations and setting a national standard for this test can be considered using successful models for this test (19).

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