nist) in experiments involving isolated tissues, conscious animals and anesthetized animals. Graphic presentations of various experiments are included in training sessions. Simulation model for pharmacokinetic principles, a novel exercise developed in this department is also included. In the experimental pharmacology teaching, the emphasis is on understanding the basic actions of the drugs, mechanism of action and clinical applications.

(III) A clinical case presentation by each student

Each student under the guidance of the teacher presents a case which he/she has recorded from a ward. Basically, the approach of pharamcotherapy, a brief description of the drugs used and comparison of treatment in a given case with the textbook descriptions are presented by the students in front of a small group of students. A discussion is conducted with the help of the teacher and important practical points are emphasized. This exercise is meant to create general awareness regarding the actual practice of medicine.

Examination

Practical examination consists of 25 marks. The following five exercises (5 marks each) are included in the examination:

1. Writing prescriptions accurately with the help of informative script,
2. Exercises based on (a) handling of injectable drugs and (b) emergency therapeutics
3. Conducting the examination related to the exercises of prescription-writing and handling of dosage in an ‘open book’ fashion.
4. Changing the emphasis on experimental pharmacology towards analytical thinking and practical applications

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References


A comparative study of two evaluation techniques in pharmacology practicals: Conventional practical examination versus objective structured practical examination

Sir,

Evaluation is a systematic process that consists of finding out the extent to which educational objectives have been achieved by the students. Any evaluation process must thus be directly related to the educational objectives. The present system of assessing the students’ performance in pharmacology practicals is not relevant as many of the skills that are assessed are not required for the making of a basic medical doctor.

Practical examination is an important component of evaluation in the medical curriculum. However, evaluation of students is not easy if the criteria of objectivity, uniformity, validity, reliability and practicability have to be met. At present, practical exercises in pharmacology in most medical colleges in India are conducted and evaluated in the conventional way, i.e., a student is given an experiment to perform, a viva is conducted after completion of the practical exercise and the candidate evaluated subsequently.

Objective Structured Practical Examination (OSPE) has
been suggested as an alternative instrument for the assessment of laboratory exercises. In this, the evaluation is structured in a way that all the educational objectives of an exercise can be assessed. Also, in OSPE, questions and skills relevant for medical undergraduate training can be framed and tested keeping the educational objectives in mind. The advantages of OSPE include objectivity and uniformity in the questions and marking of students.

The objective of this study was to compare the evaluation of students’ performance in pharmacology practicals by the conventional practical evaluation versus OSPE. The students’ opinion of the evaluation methods was also assessed. Medical undergraduates in the 3rd, 4th and 5th semesters were included in the study. The students were subjected to both the conventional practical evaluation and OSPE in the same order.

There were three types of OSPE stations i.e., response stations, which consisted of short questions including graphs and diagrams requiring explanations, procedural stations where the candidate was expected to perform an assigned task and an examiner observed the student using a structured checklist, and stations for evaluating communication skills. The OSPE exercises were made as follows: Sets of eight stations each were made for the seven Pharmacy individual preparations that students normally make (carminative mixture, calamine lotion, Mandal’s throat paint, benzoyl benzoate emulsion, liment turpentine, ORS powder, Whitfield’s ointment). The order of stations was such that a student would be assessed step by step in all the relevant aspects of theory, dispensing of the preparation and communicating both in writing and verbally how a patient must take the preparation.

Similarly, sets of 14 stations each were made for the three pharmacodynamic exercises i.e., effects of drugs on frog rectus, frog heart and rabbit ileum. Making the OSPE stations in this way enabled us to assess a student in greater depth in all the relevant aspects of that exercise than is usually possible with conventional OSPE. Also we were comparing marks obtained by conventional evaluation and OSPE. It was essential that the course format be the same in both.

The OSPE exercises were pre-tested. Marks were distributed for cognitive, psychomotor and communication skills. The conventional practical evaluation was conducted wherein groups of students were evaluated by different examiners. An example of task stations along with the checklist for the examiner and mark allotment is given in Appendix 1.

The results of 162 students who participated in both the evaluations are presented (Figure 1). As is evident, the scoring in the OSPE was significantly better than in the conventional system. The average scores of students were significantly higher with OSPE (33.1 Vs. 28.8) with 28% students scoring more than 75% marks whereas only 4% scored more than 75% with the conventional evaluation. Students rarely get more than 70-75% in the conventional evaluation system, as marks are given in a subjective manner based on the teachers’ discretion and teachers may set their own limits for evaluation. In OSPE, on the other hand, students may either score full marks if all answers are correct or no marks if all the answers are wrong.

Two students scored zero marks despite being present for the evaluation, which is seldom seen in the conventional system of evaluation. The marking in OSPE is on the basis of specific answer checklists and marks are not given for the student’s mere presence. Thus the marks were more widely distributed in OSPE, with the students getting marks at either extreme (0-44).

63.8% of the students felt OSPE to be a better method of evaluation. The main reason given for this was greater objectivity and more uniform evaluation. 27.1% of students did not respond to this question. Only 2.6% of the students felt that OSPE was not able to test either the knowledge or the practical skills adequately.

The questions for OSPE stations were framed keeping in mind the objectives of the exercise after detailed discussion and specific answer checklists were made for all the questions, hence it is felt that the instrument is more objective and valid. OSPE required more planning, organization, pre-testing and manpower for assessments. The totaling of marks by OSPE is more time-consuming as marks are specified in the checklists. This may prove to be cumbersome if large batches of students have to be assessed. In contrast it is relatively easy to conduct practical exams in the conventional system.

The advantages of OSPE, however, outweigh its disadvantages as an evaluating tool. This kind of evaluation includes objective assessment of cognitive, psychomotor and communication skills with proportional distribution of marks with greater student satisfaction. The limitations of the present study were that inter-station reliability was not tested, also that a greater amount of lecture content had been covered by the time students were evaluated by OSPE.

The study shows that it is possible to evaluate a large number of students in an objective and uniform manner. OSPE should be introduced as an evaluation tool for the undergraduates in Pharmacology practicals. However, we suggest that OSPE may not replace the existing system totally but should complement it.

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References


Appendix 1: Pharmacy task station.
You are provided with prepared benzyl benzoate emulsion. If you are satisfied with it dispense 20 ml of it.

<table>
<thead>
<tr>
<th>Checklist for examiner</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Measure 20 ml correctly</td>
<td>0.25</td>
</tr>
<tr>
<td>2. Puts in a dark bottle</td>
<td>0.25</td>
</tr>
<tr>
<td>3. Puts a cork on it</td>
<td>0.25</td>
</tr>
<tr>
<td>4. Puts a dark colored cap over it</td>
<td>0.25</td>
</tr>
<tr>
<td>5. Ties a pharmaceutical knot</td>
<td>0.25</td>
</tr>
<tr>
<td>6. Label – primary</td>
<td></td>
</tr>
<tr>
<td>The emulsion</td>
<td>0.25</td>
</tr>
<tr>
<td>Patient’s Name</td>
<td>0.25</td>
</tr>
<tr>
<td>Patient’s Age</td>
<td>0.25</td>
</tr>
<tr>
<td>Patient’s Sex</td>
<td>0.25</td>
</tr>
<tr>
<td>Patient’s Registration No.</td>
<td>0.25</td>
</tr>
<tr>
<td>Directions – Apply all over the body from neck downwards, after a thorough cleansing bath. Repeat the application after 12 h, followed by a change of clothing after 24 h.</td>
<td>0.9</td>
</tr>
<tr>
<td>Pharmacist’s signature</td>
<td>0.25</td>
</tr>
<tr>
<td>Date</td>
<td>0.25</td>
</tr>
<tr>
<td>Pharmacist’s Address</td>
<td>0.25</td>
</tr>
<tr>
<td>Pharmacist’s Registration Number</td>
<td>0.25</td>
</tr>
<tr>
<td>7. Secondary label ‘for external use only’</td>
<td>0.25</td>
</tr>
<tr>
<td>8. Secondary label ‘Shake the bottle before use’</td>
<td>0.25</td>
</tr>
<tr>
<td>9. Neatly dispensed</td>
<td>0.75</td>
</tr>
<tr>
<td>Total</td>
<td>5.0</td>
</tr>
</tbody>
</table>

The other side of OSPE

Sir,
Pharmacologists in India have been using Objective Structured Practical Examination (OSPE) as a method of evaluation since the early nineties. It has been often touted as a good substitute for the conventional method of practical examinations since it is more objective. At the department of pharmacology, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Pondicherry we have used this method for evaluating medical laboratory technicians and subsequently, in 1999, introduced it as a method of evaluation for the formative exams conducted for medical undergraduate students in pharmacology. With the passing of time I have become progressively disenchanted with this method for the following reasons outlined below.

1. **Time constraint**: In JIPMER we have to examine a batch of approximately 30 students over a period of two and a half hours. Due to space constraints we are able to set up a maximum of 10 stations only. If we allot each station 5 min, it will take 50 min for a batch of 10 students to complete all stations. Hence we need three hours to examine one batch. Cutting the time spent in each station was not an option for us since some of the tasks (such as giving an I.V. injection, or communicating to patients on proper use of oral contraceptive pills) required this amount of time. If we gave students less time it would amount to testing how fast they could do the task rather than how well they could perform it.

2. **Logistical problems**: There were technical difficulties in setting up many sets of experiments for each station. For example, we used to have a station where an isolated frog rectus tissue was mounted (by us) and the student had to inject a given volume of acetyl choline and record the response. We had to put up three tissues (three separate baths) for a single station so that there was sufficient time for the tissues to relax before the next student came to add the drug. We also needed one technician to stand-by filling the reservoirs, rinsing the syringes and flushing the baths. In the course of the examination, if one of the tissues stopped working or a technical fault developed, there was no time to repair the set-up since the student had to go to the next station or else would hold up the entire batch.

3. **Maintaining uniform difficulty levels**: Thirty students (half the batch) would have the same set of ten stations. The next batch of thirty would come after a gap of one week and have to be given another set of stations. Maintaining uniform difficulty levels between batches is indeed a very difficult undertaking.

4. **Shortage of observers**: In order to include more procedural stations we needed to have sufficient number of observers. All faculty and residents had to be present as observers whenever an OSPE was to be conducted. This left us with few residents to tackle the organizing – like escorting the students into the lab, giving instructions etc., including technicians as observers was not feasible since the lab staff were needed in the procedural stations to facilitate the observers (mopping up spills, topping up test tubes with solutions, rinsing the bell to keep time etc.). Unless there was full attendance (among faculty and residents) it became difficult to conduct an OSPE with many procedural stations.

5. **Observer fatigue**: After observing the same station for ten or more students observers get tired, bored and careless. On one occasion we found that the batch of students who had a particular observer for a task scored between 3-5 out of ten whereas the batch which went to another observer (the task was the same) scored 8-10. We then learnt that the person giving more marks was giving tips to the students to complete the task. This happened because the observer got bored and wanted to interact with the students.

6. **Time consuming**: Preparations are time consuming especially preparing the checklists, printing them, etc. A lot of planning has to be done. After the OSPE, tabulation of marks takes a long time especially if many stations are arranged. Considering the fact that during six months of the year we have three batches of students and that for each batch we conduct five notified tests (all of which include practical examinations) these cumbersome procedures soon became tiresome.

7. **Problems with electricity**: At times, just before the OSPE