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Research Article

Questionnaire based assessment of teaching effectiveness during a lecture series on pharmacotherapeutics

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ABSTRACT

Background: Lecture is a widely accepted method of teaching & learning. It provides more of surface learning and covers larger text in specified time. However it has a disadvantage that there is no assessment about the extent of knowledge learner receives. Hence, we designed a daily questionnaire based evaluation technique.
Methods: Without disclosing the topic, second year MBBS students (mean n=23) after learning from lecture series in Pharmacology, participated voluntarily to a questionnaire based task on eight therapeutic lecture topics. They wrote answers separately in 5-10 minutes before, and after delivery of text without referring to notes i. e. pre-test & post-test. Papers were valued on score basis, data recorded, interpreted and analyzed.
Results: Mean acceptability (81.4%), mean improvement (94%), mean collective maximum score (96%), mean individual maximum score (92%) were observed. 85-100% participants out of total 184 in eight therapeutic lecture topics passed in post-test (None passing in Pre-test) reflected good improvement in cognitive structure.
Conclusion: Performance in such tests provides feedback on teaching effectiveness, specificity & adequacy of knowledge gained by learners.

Keywords: Questionnaire, Cognitive domain, Pre-test & post-test, Collective maximum score

INTRODUCTION

Therapeutics is an integral branch of pharmacology, collectively termed as pharmacotherapeutics. It means "to treatise", hence includes selection of drugs for treatment of specific disorders. It also includes different therapeutic strategies in benefit of patients. Thus it is second important pillar in patients' health care, after diagnosis. In present curriculum, pharmacology and therapeutics is taught to second MBBS, BDS, BSc, and also many paramedical students.

Learning is defined as modification of behavior as a result of exercise, practice or experience.[1] As per theory of meaningful verbal learning, many basic facts of medical sciences have to be presented.[2] Lecture is widely accepted method of teaching & learning. It provides more of surface learning and covers larger text in specified time. Learner explores relationship between received elements and deduces strategy to solve problems by linking surface & deep learning.[3]

Lecture method has disadvantage that there is no assessment about the extent of knowledge learner receives, as audience is passive for considerable longer period of time (45-50 minutes) leading to concentration lapses.[4] In curriculum, lecture is of 60 minutes duration using chalk board or other audiovisual aids. Traditionally in medical schools there is growing dissatisfaction over quality of learning.[5] It has been found at many instances

that, medical teachers in India have not joined the profession for the love of teaching.[6] In an attitudinal study on feeling of medical teachers, weaker areas identified are:[7]

1) Lack of feed-back on teaching effectiveness from students,

2) Many teachers do not have acquired teaching skill,

3) Less specificity and adequacy of knowledge to be gained by learner.

Change in cognitive structure of learner can be indirectly inferred from ability to think, feel or do the task.[8]

There is no method to evaluate attention improvement, minimize concentration lapses to facilitate reception, knowledge interpretation and better recall in traditional lecture series. Aforesaid situation analysis demands simple and feasible evaluation method to improve learning.

Hence a daily questionnaire based evaluation has been designed and tested on II M.B.B.S. batch, learning pharmacology to assess the above weaker areas.

METHODS

This was a prospective study using paper-pencil technique. It is also devoid of interference with departmental and college administration, requiring no separate funding. It was conducted only after approval from institutional ethics committee.

We designed objective type questionnaire based tasks. Those tasks contained, 5-8 brief simple questions based on 'must know' aspect of each topic. On a daily basis we made second MBBS third term students to solve these questionnaires.

Every day, 23 willing students were tested in therapeutic lecture series after completion of the topics mentioned in syllabus. Such willing participants, without prior intimation, were asked to write the answers of questionnaires in 5-10 minutes before the lecture, as pre-test. A post-test was also conducted after delivery of text. The students were not provided access to their notes. The topics were about the pharmacotherapeutics of:

- Urinary Tract Infection,
- Sexually transmitted diseases,
- Glaucoma,
- Poisoning,
- Edema,
- Rheumatoid arthritis,
- Bronchial asthma,
- Respiratory Tract Infection

Answer sheets were evaluated on score basis, by a teacher, who covered the topic. These were returned to participants during next scheduled lecture. Tabulation, compilation, calculations were done by second teacher, while data interpretation, analysis and required formatting were done by a third teacher during and till the end of series by same person.

Students were asked to appear in the 'part completion test' on a pre-planned date. Following parameters were worked out:

1. Acceptance: Percentage of students participating, out of total attendance.

2. Mean Scores: Mean of score obtained in four different aspects i.e. classification, indications for use, clinical & applied aspect of drugs and others. This was done each time separately for pre-test and post-test.

3. Improvement: Students were considered as improved if

   a) He scored >50% in post-test (passed) or

   b) He scores more than double the score of pre-test.

4. Adequacy of text administered: This was reflected by collective maximum score i.e. sum of highest scores in each aspects.

RESULTS

Total 184 out of 233 students, participated in 8 tests conducted on therapeutic lecture series. (Mean n=23 of participants in each group). At the end of data analysis, we found that, acceptance was in the range of 74-92% (Mean = 81.4%). Improvement was in the range of 85-100% (Mean = 94%). The mean scores and improvement are shown in Table 1. There was increase in mean post-test scores in all the four study parameters as well as in total scores (Figure 1).

Mean collective maximum scores were 96% of total assigned marks, which indicated adequacy of text administered and effective teaching (Figure 1) None of the participants passed in pre-test, while 85-100% participants passed in post-test. Only 15% of the participants could not score passing marks in post-test. Individual maximum score was 92.8%. The students did not report for 'part completion test' on the scheduled date, hence it could not be conducted.

Table 1: Pre- & Post-test analysis of participants in questionnaire based test.

	Asthma (Bronchial)	Urinary tract infection	Sexually transmitted diseases	Glaucoma	Poisoning	Edematous states	Rheumatoid arthritis	Respiratory tract infection	Total
Pre-test	17.4	12	24.4	14	20.8	20.6	24	18	18.6
Pos-test	70.6	78	66.8	68	65	80	78.5	82	73.4
Improvement	100%	85 %	90%	91%	93.7%	100%	95.8 %	100%	

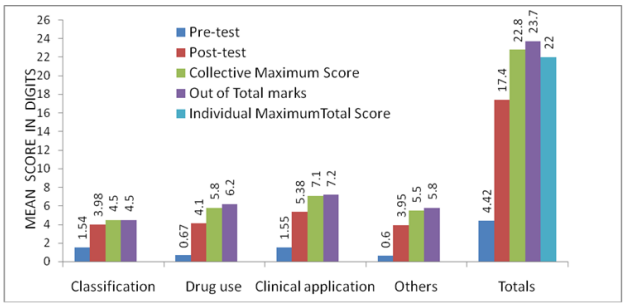

Figure 1: Adequacy - Performance analysis in questionnaire based test.

DISCUSSION

In this study the participants, after properly conceiving nature of test; have shown definite modification of behavior and predictable change in cognitive structure. After going through this exercise they showed improvement and passing in post-test. This reflects improvement in attention of pupils. Such test provides feedback on teaching effectiveness from collective and individual maximum scores of students. The test method has potential to improve above-said weaker areas in teaching. Performance in such type of test, if coupled with performance in part completion test may form a fair basis of continuous internal assessment. Continuous internal assessment means, "acquisition of predetermined desirable behaviors, dealing more with abilities, which cannot be tested in summative evaluation while learner are under continuous observation".[9] Such a formative evaluation however should never be taken for final pass/fail decision.[9] By using this method, we can also identify poor learners, who require counseling for gross attention lapses. Similarly a comparison amongst two batches can also be done by such test.

Brings et al has already defined instructions, which provide controlled environment to mould learning in pre-decided way.[10] There are recommendations that a complex task should be broken down into smaller simpler tasks to achieve improvement in teaching learning process.[9]

Limitations

- A tight teaching assignment and unwilling learners cause, time & subjective constraints.
- There is also disinterest in some of teaching staff for such activities.
- Only surface learning and short term memory lasts for upto 20-30 minutes by hearing process. Deep learning (conceptualization) needs revision of topic, particularly when practical curriculum does not correlate with theory as it is in pharmacology.
- This method can only test development of cognitive domain. Other domains like psychomotor and affective remain untouched by this method.

CONCLUSION

Evaluation by above said method is possible in routine lecture and classes. The improvement in students' attention is the cause of improvement in their behavior. This method can for a part of continuous internal assessment. When such performance of superficial learning is combined with the performance in periodical tests, it will be a fair assessment.

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Ethical approval: The study was approved by the institutional ethics committee

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