

Periodic Unit and its Effect on Improving Academic Performance of Students in Anatomy- A Pilot Study

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ABSTRACT

Introduction: Anatomy is one of the basic sciences of medicine. Optimal anatomical knowledge is essential for competent future doctors. Assessments in medical education not only help the students but also, the teachers to address the critical areas of weakness among the students and guide them. Most of the times, the process of periodic assessment becomes stressful for the students and an extra work for the teachers.

Aim: To evaluate the effectiveness of Periodic unit test in improving academic performance of first year MBBS students in Anatomy.

Materials and Methods: A pilot study was conducted among 26 students of first year MBBS belonging to two dissection tables- table A and table B (randomly selected) for a period of six months. Each table consisted of 13 students. Marks of the 1st and 2nd internals of both table students were analysed with and without intervention (periodic unit tests). Feedback was taken from the

students about the periodic unit tests by a questionnaire with 11 statements (answered using Likert scale). Median scores were calculated for each statement. Independent t-test was done between the 1st and 2nd theory internal assessment marks of both the table students using Statistical Package for Social Sciences (SPSS) software.

Results: About 76.9% of students had performed well in the theory internals with intervention (periodic units) than without intervention. In the feedback, all the students were of the opinion that the periodic unit tests were not stressful and helped them in various ways in the preparation for the Internal assessment examination.

Conclusion: Formative assessment and appropriate feedback by the mentors help students to score marks and gain confidence about the subject.

Keywords: Assessment, Internals, Student feedback

INTRODUCTION

Anatomy is one of the corner stone subjects in medical education [1]. Sound knowledge of Anatomy is vital for future clinical practice. Assessment and evaluation are crucial steps in educational process [2]. Being a powerful tool, formative assessment helps students to evaluate and to identify the lacunae in the process of learning Anatomy without academic penalty. With effective application formative assessment should aid students to maximise the learning abilities and acquiring deeper knowledge than just a mere tool of checking the anatomical facts learnt [3].

Periodic assessments are tests which are standard-based, intended to grade and provide content-specific instructional guides. They are designed to guide and focus professional development and instruction, identify areas for improvement, intervention, and familiarise students with the content and format of tests [4].

Periodic assessments provide teachers up to date information about what each student knows so that teachers can focus to the learning needs of every student. Periodic assessments measure students' learning and help teachers to keep track on records of their performance [5], conductance of curriculum and give stimulus to students to study. It also provides evidence to both parents and institution regarding students' progress [6].

There are various methods of assessment in Anatomy. Theory examinations includes Multiple Choice Questions (MCQs), long and short essay questions. Practical examination includes spotters, surface marking, discussion, Objective Structured Practical Examination (OSPE) etc. Written examination is the most widely used assessment method for knowledge [7]. Essay questions carries more marks in the theory assessment which has to be answered by processing, summarising, and evaluating the information hence they demand more time to answer [8]. Although students are used

to theory examination since lower classes, where the answers would be given by the teacher. But students find it difficult to meticulously organise the answers and score more marks especially in Anatomy. So the present study was undertaken with the aim to conduct periodic theory tests to the small group of students after each topic and to give feedback on the answers, mistakes and time management with respect to each student. Also, to sensitise students to more number of questions from each topic thus intended to make them well-equipped for future assessments (Internals).

MATERIALS AND METHODS

A cross-sectional pilot study was conducted during September 2018-March 2019 for the duration of six months in the Department of Anatomy, JSS Medical College, Mysore, Karnataka, India, involving 26 students. In the dissection hall students were allotted to tables according to their roll numbers. For each table of 13 students, a table teacher was allotted and they were to be changed after internals. In this study, table of students were selected because it was easy to give unit tests and feedback during dissection hours. The study was approved and cleared by Institution of Ethics Committee (JSSMC/IEC/181120/02 NCT/2020-21).

Study Procedure

Two tables, table A and table B (with 13 students each) were randomly selected for the study for comparison purpose. Students were explained about the intention of the study and those who were willing were included in the study. Table A students were given periodic theory tests after finishing each dissection topic. The answer papers were evaluated and feedback was given to them regarding how to organise the answers, appropriate diagrams to be written and how to manage the time, whereas table B students wrote 1st internals without periodic table tests after each topic. The

performance of the students belonging to table A and table B were compared after 1st internals.

After the first internals table B students were given periodic theory tests after finishing each dissection topic. The answer papers were evaluated and feedback was given to them regarding how to organise the answers, appropriate diagrams to be written and how to manage the time. Whereas table A students wrote 2nd internals without periodic table tests. The performance of the students belonging to table A and table B were compared after 2nd internals.

Feedback was taken from students about the periodic assessments using semi structured questionnaire framed in simple and comprehensive language, which contained 11 statements as shown [Table/Fig-1]. Out of 11 statements 9 were positively framed and 2 (statements 9 and 10) were negatively framed. The questionnaire was validated by senior faculty of the department and members of Medical education unit of the college (FIAMER fellows). Students were asked to grade the statements using five-point Likert scale (Response 1- strongly disagree, 2- disagree, 3-neutral, 4- agree, 5- strongly agree) [9]. The grading was tabulated and median score was calculated for all 11 statements.

Sl. No.	Statements
1	Periodic tests helped to finish studying portions for the internals
2	Periodic tests helped to organise the answer
3	Periodic tests helped to score more marks in the internals
4	Questions asked in the tests were useful
5	Periodic tests helped to perform better in practical internals
6	Periodic tests helped in revision of the topics
7	Because of periodic tests there was improvement in the internals results
8	Would you recommend the tests in future
9	Whether process of writing periodic tests were stressful
10	Periodic tests affected the performance in other subjects
11	You think periodic tests will help for better performance in university exams

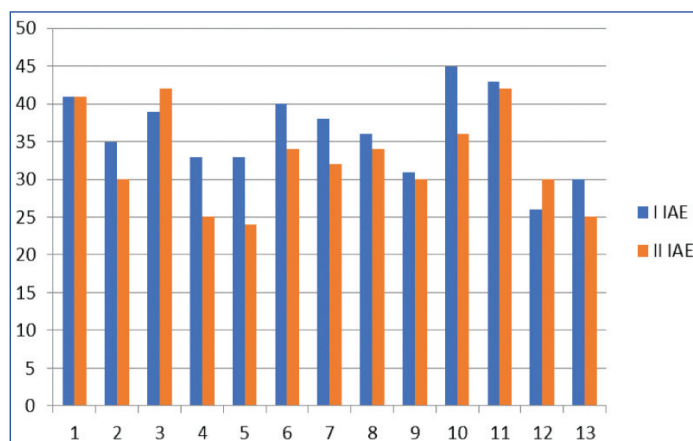
[Table/Fig-1]: Statements in feedback forms.

STATISTICAL ANALYSIS

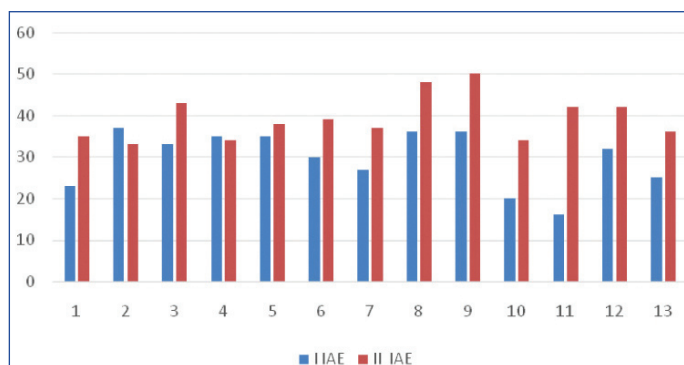
Independent t-test was done between the 1st and 2nd theory internal assessment marks of both the table students. Median score was calculated for all the eleven statements. Statistical analysis was done using IBM SPSS software version 20 and Microsoft Office Excel.

RESULTS

In table A out of 13 students, 10 students had scored more marks in the 1st internals compared to second internals. In table B, out of 13 students, 11 students had scored more marks in the 2nd internals than 1st internals [Table/Fig-2,3]. Those students with interventions have performed better in both tests as the p-value is significant and this can be seen looking at the average [Table/Fig-4,5].



[Table/Fig-2]: Comparing marks of Table A students in I and II internals (X axis- individual students and Y axis- marks obtained in I and II internals). IAE: Internal assessment examination



[Table/Fig-3]: Comparing marks of Table B students in I and II internals (X axis- individual students and Y axis- marks obtained in I and II internals). IAE: Internal assessment examination

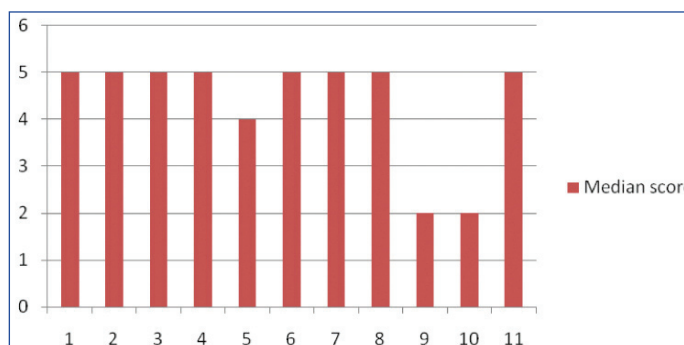
1 st Internal assessment examination (marks)			
Table A Mean±SD	Table B Mean±SD	t-value	p-value
36.154±5.5052	32.692±6.2767	2.685	0.013*

[Table/Fig-4]: Independent Samples Test done between the students of 1st and 2nd table in 1st IAE. *significant p-value

2 nd Internal assessment examination (marks)			
Table A Mean±SD	Table B Mean±SD	t-value	p-value
29.615±6.8379	39.308±5.4065	2.879	0.008*

[Table/Fig-5]: Independent Samples Test done between the students of 1st and 2nd table in 2nd IAE. *significant p-value

Median scores for each statement in the questionnaire were as shown in [Table/Fig-6]. Median score for all the statements is 5 except statement 5, 9 and 10 for which median scores were 4, 2 and 2, respectively. Median scores of 4 and 5 (strongly agree) indicates students were in agreement with the statements whereas median score of 2 indicates that students were in disagreement with the statements.



[Table/Fig-6]: Median scores of statements in the questionnaire.

DISCUSSION

Assessments can motivate the stakeholders by its relevance, content, teacher's enthusiasm and group dynamics. Assessment has powerful positive stimulating effect on learning [10]. It is difficult to assess different levels of progress from same exam hence well-designed assessment methods and evaluation serves as effective educational device [10,11]. With the provision of providing feedback formative assessment helps students in identifying their strength and weakness and allows for self-reflection and action, thus support the process of learning in a non threatening environment [11,12]. Continuous assessment is a type of teaching learning activity [13]. It allows the students to study his valued scripts, to know his mistakes, get clarification from the teacher and rectify his mistakes for the future assessments [14].

Always evaluated assignments/assessments have more value than ungraded ones. An immediate appropriate feedback can prevent

lot of misconception and inefficient performance in the future. Any delay in the evaluation and feedback results in misunderstandings and misconception, about the subject fixed in the memory and carried along [15].

Test oriented teaching and learning favours students who practices strategic learning method [12]. While designing formative assessment method three key things should be kept in mind, the method should be able to identify the gaps in learning, familiarise students to the expectations of future summative assessment and guide the students in proper direction by providing critical feedback. Such a method will more familiarise the students about the topic under question, also helps in better retention and deeper learning. The same has been undoubtedly proven by Cognitive psychology research [16].

Incorporation of formative assessment into the process of teaching learning will encourage adoption of an active learning approach and therefore may help achieve deeper learning [17].

In the present study, from the statistical analysis of the test scores and feedback received it is very much evident that with intervention (periodic unit tests) students have performed well in the assessment. Median score in the feedback form for statement 5 is 4 and for statements 1,2,3,4,6,7,8 and 11 is 5 which implies that students were in agreement that periodic tests helped them to finish studying portions for the internals, organise the internals, score more marks in the internals, do better in practical internals too, revise the topics before internals, would like to recommend tests in future and they were of the opinion that it would help them to do better in university examination.

Only for statement 9 (Whether process of writing periodic tests were stressful) and statement 10 (Periodic tests affected the performance in other subjects) median score was 2 implying that students were not in agreement that writing table tests was stressful and it affected performance of other subjects. Students were of the opinion that table tests helped them to study the topics in time and revise the topics to perform well in the internals. Based on the positive results and positive feedback from the students, periodic table test was introduced to all the tables of the batch.

Limitation(s)

The main limitation of the study was smaller sample size since only two tables were included and did not consider the final exam scores.

CONCLUSION(S)

From the study, it could be concluded that periodic unit tests helps students to perform better in the internals and hence in the university exam. These formative assessments helped them in various ways to score marks and better understanding of the subject rather than being stressful process for the students.

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