

Original Article

Improving Academic Performance of Medical Undergraduates: Impediments and Solutions

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ABSTRACT

Introduction: Medical undergraduates selected for studying medicine through exceedingly competitive pre-medical entrance tests are highly intellectual and hardworking, yet many students perform poorly in internal examinations perhaps because the initial exposure to medical education is tense and uninteresting. This study aims to find out probable reasons that could affect optimal academic performance of first year medical students.

Methodology: First year medical students of 3 consecutive academic batches were asked to fill a feedback form comprising of questions (regarding their opinion for inclusion of clinically oriented teaching and how often they read a topic prior to and after a lecture). Students were also asked to mention the problems affecting their academic performance.

Results: 95.6-98.1% of students wanted clinically oriented teaching. 1.9-10.3% of students read a topic in advance (either always or most of the times) but the percentage of students who never or sometimes read the topic in advance was alarmingly very high (89.7-98.1%). 20.8-25.4% of students read the topic for lecture (either always or most of the times) on the same day after the lecture but the percentage of students who never or sometimes read the topic on the same day after the lecture was quite high (74.6-79.2%).

Conclusion: Inclusion of clinically oriented classes and integration of clinical and non-clinical subjects might enhance students' academic performance by evoking interest in subjects to read a topic before and after lecture. Provision for adequate hostels, personal counselling and repeated motivation which is frequently ignored by educators might also help.

INTRODUCTION

The medical undergraduate students in India are selected for joining the M.B.B.S. course (medical course) through

a pre-medical entrance test which is competitive and requires high intellect and a dedicated preparation. A very small percentage of the aspiring students get admission to the course. Though it is a rewarding experience for those who get selected to the course, yet it is a tremendous stress to them to undergo the rigorous training to become doctors. These students are taught basic sciences as their subjects during their first professional year (i.e. during first and second semester of six months each). The subjects being taught to them are human anatomy, physiology and biochemistry. The module of teaching is predominantly didactic lectures and laboratory practicals. During their training, the students are regularly assessed on the syllabus. Despite the fact that these students are meritorious, highly intellectual and hardworking, yet a considerable proportion (15%) of them perform poorly¹ in examinations and are not able to clear their first professional examination in first attempt. This creates a sense of inferiority complex amongst the students who are lagging behind. This sometimes leads to psychological problems and stress that can further lead to deterioration of their academic performance in subsequent years.² This trend has been noted invariably in every batch. If the students are taught the topics with an added emphasis on the relevance of that topic from a clinical point of view, then it will definitely prompt the students to learn better. The same is also true, if the student come prepared for the topic to be covered in a lecture and revise the same after the topic has been covered. Thus, this study was planned to assess responses from first year medical students. Through this we wanted to decipher the probable reasons that affect their optimal academic performance.

METHODS

The cross sectional study was carried out in our medical college (Delhi, India) after being approved by the Ethical committee for Human Research of our institute. First professional year is comprised of two semesters i.e. first and second. This study was carried out on 3 consecutive

academic batches of first year medical students namely Batch 1, Batch 2A, Batch 2B and Batch 3 (At least 50 students in each batch).

Batch 1 was the academic batch in which we initiated the study for the first time. The students in this batch were enrolled during 2nd semester. Batch 2 was the subsequent academic batch enrolled in the study. This batch was enrolled in first semester as well as second semester. Hence, the results are described for this batch under the headings "Batch 2A (first semester) and Batch 2B (2nd semester)". The students of third academic batch were enrolled during first semester. After obtaining consent for participation in the study from the students, a feedback form (Table 1) was distributed to them. The students were given the option of choosing one of given choices or to select "can't say" option (if they didn't know or wanted to avoid answering any question). They also had a choice to give their own comments or to withhold their response to any question. The questions asked were whether they would like to have clinically oriented classes or not. The

students were also asked about how often they read a topic prior to a scheduled lecture and how often they read the topic on the same day after the lecture.

After obtaining the student's feedback, the data was analysed and results were compiled. The results were expressed in terms of percentages. The comments written by students were also evaluated so as to ascertain their problems and take up measures to help students perform academically better. The students were also asked to share their overall experience regarding the teaching sessions delivered to them in the department of biochemistry. This was done to normalise factors like competency of an individual teacher in delivering classes.

RESULTS

The students were asked in the questionnaire whether they would like to have clinically oriented classes or not. The data analysis of four batches revealed that 95.6-98.1% of the students wanted the teaching to be clinically oriented (Table 2).

Table 1: Format of the feedback form used for assessing the responses of medical students

Instructions: Please don't write your name or roll no on this sheet of paper. Your feedback will be kept confidential. You have to choose (tick) the response that you think is most appropriate. You may choose more than one response. If you don't agree with any response you may mark the choice as can't say. You may also give any other relevant suggestion at the space provided for the same. If you do not wish to answer any of the questions included in the questionnaire, you may skip them and move on to the next question.

Question	Response 1	Response 2	Response 3	Response 4	Can't say	Any other relevant suggestion
1 Case/clinically oriented teaching should be included	Yes	No				
2 How often do you read a topic prior to a lecture?	Always	Most of the time	Something	Never		
3 How often do you read a topic on the same day after a lecture?	Always	Most of the time	Something	Never		

Table 2: Results of analysis of feedback obtained from first year medical students regarding clinically oriented teaching to be included or not

	M.B.B.S. Batch 1 (n=101)	M.B.B.S. Batch 2A (n=126)	M.B.B.S. Batch 2B (n=76)	M.B.B.S. Batch 3 (n=91)
Response 1 (Yes)	98.1% (n=99)	97.6% (n=123)	96.1% (n=73)	95.6% (n=87)
Response 2 (Yes)	1.9% (n=2)	2.3% (n=3)	3.9% (n=3)	4.4% (n=4)
Total	100%	100%	100%	100%

n= Total number of participants

Table 3: Results of analysis of feedback obtained from first year medical students regarding how often they read a topic prior to scheduled lecture

	M.B.B.S. Batch 1 (n=101)	M.B.B.S. Batch 2A (n=126)	M.B.B.S. Batch 2B (n=76)	M.B.B.S. Batch 3 (n=91)
Response 1 (Always/Most of the time)	1.9% (n=2)	10.3% (n=13)	7.9% (n=6)	5.5% (n=5)
Response 2 (Never/ Sometimes)	98.1% (n=99)	89.7% (n=113)	92.1% (n=70)	94.5% (n=86)
	Total 100%	Total 100%	Total 100%	Total 100%

n= Total number of participants

Table 4: Results of analysis of feedback obtained from first year medical students regarding how often they read the topic taught in lecture on the same day after the lecture

	M.B.B.S. Batch 1 (n=101)	M.B.B.S. Batch 2A (n=126)	M.B.B.S. Batch 2B (n=76)	M.B.B.S. Batch 3 (n=91)
Response 1 (Always/Most of the time)	20.8% (n=21)	25.4% (n=32)	26.3% (n=20)	23.1% (n=21)
Response 2 (Never/ Sometimes)	79.2% (n=80)	74.6% (n=94)	73.7% (n=56)	76.9% (n=70)
	Total 100%	Total 100%	Total 100%	Total 100%

N= Total number of participants

The students were further asked in the questionnaire whether they read a topic in advance to the scheduled lecture. The data analysis of various batches revealed that barely 1.9-10.3% of the students read a topic in advance (either always or most of the times) but the percentage of the students who never or sometimes read the topic in advance was alarmingly very high (89.7-98.1%) (Table 3).

Besides this the students were also asked in the questionnaire whether they read or revised the topic taught on the same day after the lecture. The data analysis of three batches revealed that only 20.8-26.3% of the students read the topic of the lecture on the same day (either always or most of the times) but the percentage of the students who never or sometimes read the topic after the lecture on the same day was quite high (73.7-79.2%) (Table 4). Thus, we consistently observed the same pattern in every batch each year.

DISCUSSION

In our study, we have found that a majority of the students want the topics to be taught to them in a clinically oriented way so that it generates interest in the subjects and motivates the students to read a topic in advance or immediately after the scheduled lecture so as to perform their best in exams. The students have mentioned in their feedback that they would like to be taught the topics in the form of clinical case discussion or clinical history discussion. They have suggested that they can be shown clinical cases in the form of videos or a live patient. They have also suggested that a few clinical skills can be taught to them using a virtual patient or a mannequin. Studies in literature have also proven the use of virtual patient for training medical students.^{3,4} The students feel that clinically oriented classes would generate interest in the topic and stimulate their thinking process. Thus, they feel that it may help them to understand a concept deeply and retain it better. This concept has been tested in a study by

Goldman et al.⁵ The students commented that it may reduce mugging up notes and help them perform better in examinations.

From literature search we have found that problem based discussions and clinical case discussions are better teaching methods than a didactic lecture.⁶⁻⁸ The medical students during first year of their training are taught the subjects exclusively through didactic lectures and laboratory based practicals. There is hardly any emphasis given to the clinical aspects of the topics being taught to the students in subjects like anatomy, physiology and biochemistry. Hence the students find it extremely difficult to understand the concepts and diseases being theoretically taught. Another drawback that medical students face is that there is complete lack of clinical postings to the hospital in their first year. However, they do get posted to clinical wards and OPDs in due course of time but only when the first professional year is completed. As a result of which, they are not able to correlate their clinical findings in patients with their fundamental knowledge of anatomy, physiology and biochemistry.⁹ Thus, we strongly recommend that an integration of clinical and non-clinical subjects be there from first year itself to overcome these problems.¹⁰⁻¹³

In the results of this study, we have found that majority of the students are not able to read a topic prior to the scheduled lecture. We feel that it is very important to display the topic to be taught in lecture beforehand, so that the students can read the topic prior to attending the lecture. The students can also be distributed study material in the form of handouts which they can read and come to the lecture. Sometimes the pace of the lecture is fast in order to cover maximum topics in the given time slot. Thus, the weaker students may find it extremely difficult to understand. They may even miss out on important points. Therefore, distribution of printed material beforehand may decrease the need of taking down notes and they can focus better on understanding the topic being taught. Sometimes the topic taught in the lecture may be a difficult one and hence may need to be explained multiple times to the students which rarely happen due to limited time allotted for a lecture. Therefore, reading a topic beforehand may help students understand the lecture better even if it is being taught at a faster pace or when the topic is a difficult one. Sometimes the chapter to be taught may be quite lengthy and therefore only a few portions of it may be taught in the lecture.

Therefore, reading a topic beforehand may help students to make a note of the important portions of the chapter.

This may enhance students' performance in the examinations.

In our study, we have also found that once the lecture has been taken, majority of the students do not read or revise a topic on the same day. Reading the topic from the text book on the same day will make their concepts more clear. The students would be able to read the topic in lesser amount of time and would retain the read topic better. The scientific basis to this is called spacing effect.^{14,15}

Thus, we feel reading a topic by the students prior to, and after the lecture on the same day will certainly improve the understanding of the subject and hence may enhance their knowledge and performance in examinations.

The comments mentioned by the students in the feedback form highlights the reasons as to why they are unable to read a topic prior to and after the lecture on the same day. The students feel that they are being over burdened by the volley of internal assessment tests and viva examinations conducted so often. As a result, they are unable to find sufficient time for reading in advance besides that they find these subjects too dull to read in the absence of clinically oriented classes. Some students mentioned that they do not have hostel rooms to stay and they lose considerable time commuting to and fro to the college. Hence, they run short of time to read a topic in advance or just immediately after the lecture. Many students feel that college timings should be decreased and classes should be five days a week to help them find time for self-studying. The students have clearly mentioned that they feel too fatigued after attending non-stop classes held during 9 am – 5 pm. Some students have mentioned that they have personal reasons or problems which hinder them from studying optimally. Some students admitted that they feel distracted or disturbed by certain personal reasons which diverts them from studying regularly. Most of the students highlighted the fact that syllabus is too vast which poses a tremendous stress to them and they are not able to manage a systematic way of studying.

We know that, upon joining a medical college, there is a sudden alteration in the balance between academic and extracurricular activities that used to be there during school days. There is paradigm shift in this pattern exclusively towards academics during their medical training. The extracurricular activities usually get

neglected. Also most of the undergraduate medical students experience some kind of mental discomfort in the form of anxiety, stress or depression.¹⁶ A study in literature has found an inverse correlation between stress and academic performance in medical students.² Thus, we wish to propose certain measures that can be taken up to enable students manage their academic stress and simultaneously enjoy their challenging journey towards becoming doctors. Certain recreation facilities can be provided to students like sports, swimming pool, music classes, dance classes etc. that can help relieve stress to a good extent.¹⁷ Once in a while, excursion trips or movies can be organised by the college. Sometimes, celebrities like singers or poets may be invited to the college to deliver recreative sessions to the students. Providing yoga classes can be yet another way of alleviating stress amongst students.¹⁸ Besides this motivating students to participate in extracurricular activities during inter college and intra college festival events may also decrease stress amongst students.¹⁹ We also feel that the students should be encouraged to approach committee for personal counselling or a personal mentor to discuss their personal problems that might be affecting their studies.^{1,20,21} Regarding syllabus, we agree with the students that it is very vast and they do not get sufficient time to read. This is because the duration of the first professional year of medical course has been cut down to one year from the previously executed term of one and a half years. Hence, the teachers in the department of anatomy, physiology and biochemistry are compelled to teach the syllabus in lesser amount of time. The students often complain that a large number of academic tests being conducted over burdens them. However, we feel that repeated testing of knowledge increases retention of knowledge and superior quality of learning.²² Though, the students find it burdening, the issue can be partially addressed if our module of teaching focuses on clinically oriented classes and integration of clinical and non-clinical subjects. They may start enjoying learning medicine rather than finding it boring and burdening. We believe that clinically oriented classes will certainly evoke students' interest in first year subjects and motivate them to read a topic prior to and after the scheduled lecture which in turn would help them perform better in examinations. All students must be provided hostel accommodation to help save them as much time as possible to achieve a balance between

studies and extracurricular activities. Having got an insight into the students' problems and their preference for clinically oriented teaching, we have recently introduced in subsequent batches, problem based learning exercises, role play,^{23,24} small group discussions in our teaching methodology to promote active learning and interest in the domain of biochemistry. We have also demonstrated point of care testing instruments and have arranged for lab visits (to clinical chemistry labs) to discuss the practical implications and role of biochemistry in context with the patient care. These interventions in our teaching methodology have been greatly appreciated by the students. Though, we have just begun to introduce these changes, we wish to further escalate them in the upcoming batches in the interest of the students and patient care.

CONCLUSION

A change in the teaching module from traditional didactic lecture to clinically oriented classes and integration of clinical and non-clinical subjects might enhance the performance of the students in the examinations by evoking interest in the subjects and generating motivation in the students to read topics in advance and after the lecture. Introducing facilities for recreation activities, provision for adequate hostels, personal counselling and repeated motivation by the teachers might help the students to manage their studies effectively and to perform better in the examinations.

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