



# Pre-reading material as a teaching tool in Pharmacology for Second Professional MBBS students.

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## Abstract:

**Background:** Didactic lecture are excellent method of teaching pharmacology to large number of students but they make students passive listeners and fail to capture their attention. In order to make lectures more comprehensible and to improve the performance of students, we introduced the students to pre-reading teaching material.

**Aim and Objectives:** The present study was conducted to enhance the understanding of students in theory classes, make the classroom teaching more interactive and improve the attendance and overall performance of students by providing pre-reading teaching material.

**Material and Methods:** A total of 102 2<sup>nd</sup> professional MBBS students were included in the study. For a total of 8 lectures on Autonomic Nervous System, pre reading teaching material was provided for 4 classes and no pre-reading material was provided for other 4 classes. The assessment of students was done on the basis of written tests. Comparison was made between the performance of students with and without pre-reading material by using paired T-test. Feedback forms were filled by students and faculty members at the end of the study.

**Results:** Significant improvement was seen in the performance of the students when pre-reading teaching material was provided ( $p=0.01$ ). Feedback forms of students and faculty members revealed that pre-reading teaching material improved the understanding, attention/concentration of students and made the lectures more interactive.

**Conclusion:** Pre-reading teaching material improves the learning and performance of undergraduate medical students. It can be inducted in undergraduate curriculum so as to make pharmacology more interesting and practicable.

**Keywords:** Pre-reading material, teaching tool, undergraduate curriculum.

## INTRODUCTION:

Pharmacology is the study of how drugs exert their effects on the living systems. It involves understanding the properties of drugs and their actions, including interactions between drug molecules and receptors and how these interactions elicit an effect <sup>[1]</sup>. Acquiring adequate knowledge about drugs is one of the preliminary steps in preparing the medical student for future practice. It is important that the students appreciate the importance of pharmacology and learn to apply that knowledge appropriately <sup>[2]</sup>. Undergraduate pharmacology teaching should stress the principle of rational evaluation and developing a personal formulary on the basis of a rational comparison which can affect their ability to prescribe rationally <sup>[3]</sup>. Although didactic lectures are the main means of imparting knowledge to a large audience, the students are mere passive listeners. Hence, didactic lectures are not popular among students and they remain unmotivated <sup>[4]</sup>. Students often fail to assimilate the voluminous information provided to them. This results in their inability to integrate and apply the pharmacological knowledge into clinical situations. In the recent past, student centered approaches are being promoted to make them motivated and responsible for their own learning <sup>[5, 6, 7]</sup>. Over the years teaching of pharmacology has evolved from mere didactic lectures to audio-visual aid based lectures and computer based learning.

Pre-reading refers to reading or studying before class. It conveys one's readiness before class. Pre-reading activities can be utilized to tap students already existing background knowledge, and to provide students with new information that will help them comprehend the topic. It increases learner's interest and motivates them mentally to

be engaged in reading. Previous studies have shown that pre-reading helped learners capture key points and incomprehensible concepts before class, so they could focus their attention on the parts of the lecture related to those key points and concepts previously not fully understood<sup>[8,9,10,11]</sup>.

With the growth in digital learning activities and the internet, provision of pre-reading teaching material before a class can become more convenient and can improve the understanding, interest, attention and learning of students which will in turn have an impact on their overall performance. In order to make the conventional didactic lectures more interesting and comprehensible and to improve the attendance and performance of students, the present study was conducted in 2<sup>nd</sup> professional MBBS students by providing pre-reading teaching material.

## MATERIAL AND METHODS:

This study was conducted in the Department of Pharmacology at Shri Guru Ram Rai Institute of Medical & Health Sciences(SGRRIM&HS), Dehradun, for 3 months from 1<sup>st</sup> January 2019 to 31<sup>st</sup> March 2019. 102 2<sup>nd</sup> professional MBBS students were included in the present study. The study was undertaken after obtaining written informed consent from the students and approval from the Institutional Ethics committee. Interactive sessions were conducted to orient the departmental faculty and 2<sup>nd</sup> professional MBBS students towards the pre-reading method of teaching.

Out of a total of 8 classes of Autonomic nervous system, the 2<sup>nd</sup> professional MBBS students were given pre reading material for 4 classes (Adrenergic and Anti-adrenergic drugs) at least 5-7 days before each lecture by

uploading on the email IDs of each student. No pre-reading material was provided for other 4 classes of Autonomic nervous system (Cholinergic and Anti-cholinergic drugs). In each theory lecture, 20 minutes time was spent on an interactive session between the students and the faculty based on the pre-reading material which had been provided to them beforehand. The assessment of students was done on the basis of written tests (Two written tests of 28 marks each, consisting of short answer questions and multiple choice questions was conducted) which depicted their performance. Feedback form/questionnaire filled by the students and the faculty members at the end of the study period were marked using a 5 point Likert scale. Comparison was made between the performance of students with and without pre-reading material. Paired T-test was used to analyze the data.

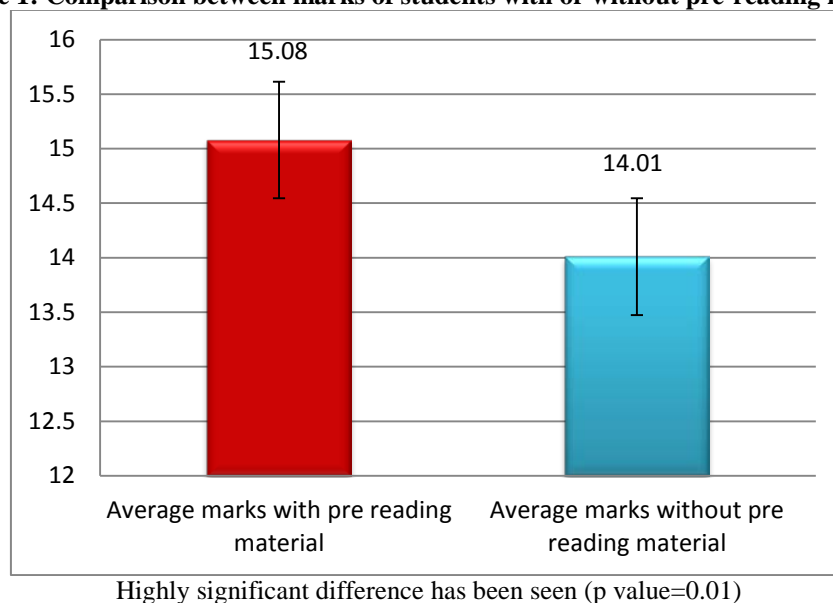
**OBSERVATION AND RESULTS:**

The outcomes of the study were measured with the help of written tests, feedback from students and faculty, and attendance of students.

The average marks obtained by students in the test in which no pre-reading material was given were 14.01±0.44 (Mean± SEM) and in which pre-reading material was provided were 15.08±0.43 (Mean± SEM). On comparison of the results of students with and without pre-reading teaching material, highly significant difference was seen (p=0.01) (Figure 1).

The feedback form/questionnaire was filled by all the students and faculty members (n=7) of Pharmacology department to know their perception regarding provision of pre-reading material, results shown in Table 1 & Table 2.

**Figure 1: Comparison between marks of students with or without pre-reading material**



**Table 1: Feedback form filled by MBBS Students (n=102)**

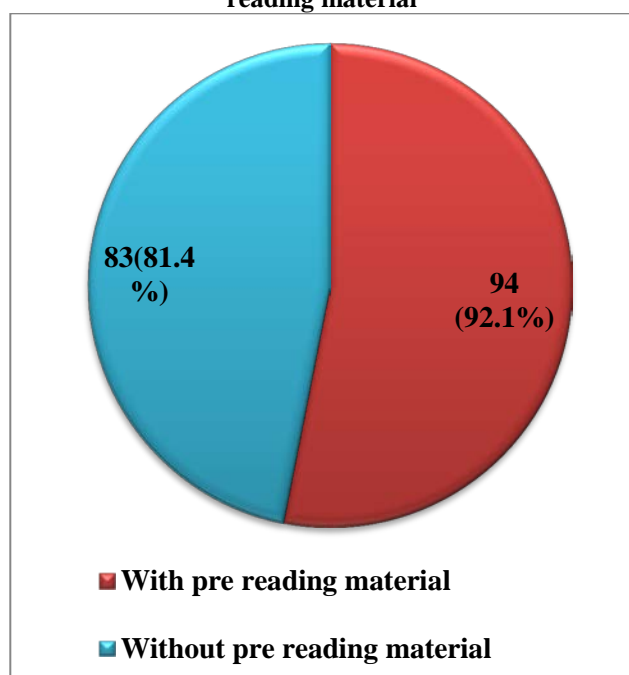
S.No	Questions/statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	Teaching with pre-reading material increases my understanding of the subject	27(26.5%)	58(56.8%)	5(4.9%)	9(8.8%)	3(2.9%)
2.	Teaching with pre-reading material increases my interest in class	19(18.6%)	61(59.8%)	17(16.6%)	4(3.9%)	1(0.9%)
3.	Teaching with pre-reading material is more interactive than the conventional teaching	38(37.2%)	53(51.9%)	2(1.9%)	6(5.8%)	3(2.9%)
4.	Teaching with pre-reading material increases my attention/concentration in class	23(22.5%)	64(62.7%)	11(10.8%)	3(2.9%)	1(0.9%)
5.	Teaching with pre-reading material adds an extra-burden to the students	14(13.7%)	19(18.6%)	37(36.3%)	22(21.5%)	10(9.8%)
6.	Contents of pre-reading material was adequate	36(35.3%)	45(44.1%)	16(15.6%)	5(4.9%)	0(0%)
7.	Teaching with pre-reading material can be implemented in routine curriculum in future	28(27.45%)	34(33.3%)	25(24.5%)	9(8.82%)	6(5.88%)

**Table 2: Feedback form filled by Faculty Members Pharmacology Department (n=7)**

S. No.	Questions/statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	Teaching with pre-reading material provides better understanding of topic	2(28.6%)	3(42.8)%	2(28.6%)		
2.	Teaching with pre-reading material makes the class more interactive	4(57.2`%)	3(42.8)%			
3.	Teaching with pre-reading material increases attention of the students in class	1(14.3%)	5(71.4%)	1(14.3%)		
4.	Teaching with pre-reading material adds an extra-burden to the faculty	5(71.4%)	2(28.6%)			
5.	Teaching with pre-reading material increases the attendance in class	6(85.7%)	1(14.3%)			
6.	Teaching with pre-reading material can be implemented in routine curriculum in future	1(14.3%)	3(42.8)%	1(14.3%)	2(28.6%)	

Out of a total of 102 students, 94(92.1%) students attended the classes when pre-reading material was provided to them and 83(81.4%) students attended the classes when the pre-reading material was not provided to them (Figure 2).

**Figure 2: Attendance of students with and without pre-reading material**



**DISCUSSION:**

Conventionally, didactic lectures are the method of teaching pharmacology in various medical colleges across India. Although didactic lecture is an economical and efficient teaching method for imparting knowledge to large groups; its main drawback is that it favors passive learning in students. In order to make lectures more interesting, interactive and to improve the attendance of students, we modified the didactic lectures by providing pre-reading teaching material to students for few classes and compared with other classes in which no pre-reading

material was provided. In our study, teaching with pre-reading material significantly improved the performance of the students in the class test as compared to the test in which no pre-reading material was given (p=0.01). Our study was consistent with previous studies which showed that the performance of students was improved when pre-reading material was provided to them<sup>[12, 13]</sup>. Feedback forms from majority of the students revealed that teaching with pre-reading material improved their understanding, interest and their attention/concentration in the class. They also felt that teaching with pre-reading material was more interactive as compared to the conventional teaching. But many students agreed that pre-reading material added an extra burden to them. Majority of the students believed that pre-reading material can be implemented in routine curriculum in future. When the students are primed about a particular topic with the help of pre-reading material, attending the lecture helps them to further consolidate the material and clarify key points. This leads to better understanding of the students and makes the lecture more interesting.

Feedback forms from majority of faculty members also revealed that teaching with pre-reading material improved understanding of the topic as the students were able to answer maximum questions during the interactive session in class. It also improved the attention and attendance of the students. Previous study has shown that student's interest in a topic has a strong impact in the attendance in a lecture, which is similar to our study<sup>[14]</sup>. Study by Merrill M D et al shows students become more motivated, attentive and tend to learn better when they are involved in solving real world problems, which is consistent with our study<sup>[15]</sup>.

But some faculty members disagreed about the implementation of pre-reading material in routine curriculum in future. Majority of faculty members felt that pre-reading material added an extra burden to them as they had to spend a lot of time in preparing the contents of the pre-reading material. This shows that despite being a very effective teaching learning method, the practicability of pre-reading teaching material with limited number of faculty members can be a challenging task.

### LIMITATIONS:

In the present study, pre-reading teaching material was provided for only 4 lectures and the duration of the study was 3 months. Provision of pre-reading material for more number of lectures and for a longer duration of time could have yielded different outcomes. Also the sample size was small as the study was conducted only in one particular batch of students. If this study was undertaken in multiple batches and also in other departments of the institute, the outcomes would have been different.

### CONCLUSION:

Pre-reading material is a unique teaching learning method for teachers and students. Implementation of Pre-reading material may improve the learning and performance of undergraduate medical students. It can be inducted in undergraduate curriculum so as to make pharmacology more interesting and practicable. The introduction of pre-reading material before a lecture is an effective method in making the pharmacology lectures more comprehensible, interesting, interactive, and in improving the attendance and performance of the students which will in future widen the horizons of learning in pharmacology.

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