Educational outcomes of small group discussion versus traditional lecture among first year undergraduate medical students

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Abstract
Lecture though is effective method of teaching, it is considered as a passive means in imparting knowledge. It's time to change this means with innovative methods like small group teaching, etc.
The study was carried out with first year 140 MBBS students. These students were randomly selected and were divided in to two groups of A and B of strength seventy in each group. Lipid chemistry and metabolism was the topic selected. Pre-test for A and B group by multiple choice questions was conducted. Group B was further divided into ten sub groups, and these students were provided with specific learning objectives for the topic and after a week they were taught the topic in the form of small group discussion sessions over a period of 4 weeks. The facilitators ensured that all the group B participants were involved in the discussion. The group A remained as a whole group and underwent the didactic lecture method. Later, post test was conducted with the same MCQs. To evaluate the students perception towards the SGD for group B, we administered a qualitative questionnaire.
There was a significant improvement with post SGD group, when compared with post Lecture group. The perception of students was positive regarding small group teaching.
Introduction of small group teaching as a learning tool was appreciated by the students and led to a significant improvement in the student's performance.

Keywords: SGD-small group discussions, DL-didactic lectures, MCQs- multiple choice questions.

Introduction
These days, students are heavily burdened with lot of academics, which is making learning painful process. Didactic lectures are considered as the usual method of approach in teaching to a large group of students. It is challenging to both teachers and learners because it promotes passive learning and fails to motivate the students.[1] It is proved that students can be attentive for about 30-40 minutes during lectures. Since few decades many innovative modalities of learning are being implemented to make the learning process interesting like tutorials, seminars, case based discussions, small group discussions.[2,3] Small group discussion enhances student-faculty interaction, builds up intimacy between student and teacher and improves communication skills.[4-7] It provides a motivating environment which gives a scope to apply or recall their previously acquired knowledge. It leads to exchange of thoughts and views among the group. As a result of this the learning can become interesting for the students.[8,9] Change of method of teaching from a regular Didactic lectures to Small group teaching requires a change in the opinion of the students and also the faculty members especially the senior faculty.[10,11] The teachers have to spend more time in preparing for these small group discussions than for the regular lectures. Small group discussions (SGD) involves active participation among the students in a motivated environment.

Materials and Methods
This study was carried out among first year undergraduate medical students, in the Department of Biochemistry, S.V.S Medical College, after obtaining the consent from students and institutional ethical approval. One hundred and forty students including boys and girls were randomly selected. These participants were randomly divided in to two groups of A and B of seventy in each group. Lipid chemistry and metabolism was the topic. All the participants were evaluated with multiple choice questions and the scores were noted. Group B was further divided into ten sub groups, seven students in each sub group and only these were provided with specific learning objectives (annexure 1) for the topic. After one week these students were taught the topic in the form of 6 small group discussion sessions over a period of 4 weeks. The teachers made sure that all the group B students participated in the discussion. The teachers, asked them relevant questions and made sure that they understood the whole topic. The group A remained as a whole group and routine lectures were taken for 16 hours over 4 weeks period. After one week, test was conducted with the same MCQs used for pre-test for both the groups. The marks obtained in MCQ test in pre and post lecture for group A and pre and post SGD for group B was compared. Scores from post lecture of group A was compared with the score from post SGD of group B. We evaluated the students perception

towards SGD by giving them a qualitative questionnaire with Likert scale consisting of ten questions (annexure 2). The questionnaire was validated before it was used on students.

Annexure 1

Specific learning objectives:

1. Classification of FA with examples
2. Classification, synthesis and uses of ecosonoids
3. Classification of lipids with examples
4. Note on synthesis & catabolism of simple and compound lipids
5. Note on Cholesterol synthesis & metabolism
6. Note on Lipoprotein metabolism & transport of cholesterol
7. Note on Ketone bodies synthesis & degradation
8. Note on β- oxidation of FAs
9. Note on FA synthesis
10. Note on Lipid storage disorders
11. Note on Hyper and Hypo lipoproteinemias

Annexure 2

Feedback – questionnaire

1. Improved learning, remembrance, and performance in examination
2. Increased thinking and communication skills
3. Helped in clarifying the doubts
4. SGD was interesting and motivated you to learn Biochemistry
5. In understanding today's topic, SGD was very useful
6. Helped in answering MCQ
7. SGD method was better than the Didactic lecture method
8. Role of teacher was very important in SGD session
9. Like to have similar sessions in future
10. SGD should be included along with the regular lectures

Statistics

The data was analysed by Graph Pad Prism software 6.0 version. The numerical data of pre and post test is expressed in terms of mean±SD. Student's 't' test was used to compare the continuous variables between the groups. For pre and post test comparison of group A and group B, paired 't' test was used. For Post Lecture score and Post SGD score comparison, unpaired 't' test was used. The p value of <0.05 was considered to be statistically significant.

Results

Table 1: Comparison of pre and post evaluation test for Didactic lecture of A batch

MCQ evaluation	Pre-test score of batch A	Post test score of batch A	P value
	6.49 ± 2.29	11.21 ± 2.72	0.000

Table 2: Comparison of pre and post evaluation test for SDG of B batch

MCQ evaluation	Pre-test score of batch B	Post test score of batch B	P value
	7.44 ± 2.95	15.03 ± 3.57	0.000

Table 3: Comparison of scores obtained after post Lecture (batch A) and post SGD (batch B)

MCQ evaluation	Post Lecture score of batch A	Post SGD score of batch B	P value
	11.17 ± 2.71	15.10 ± 3.46	0.000

Table 4: Analysis of feedback from the students after SGD

S. No	Small Group Discussion (SGD)	Strongly agree	Agree	Disagree	Strongly disagreed	Neither
1.	Improved learning, remembrance, and performance in examination	78.6%	18.6%	1.4%	0.0%	1.4%
2.	Increased thinking and communication skills	52.9%	47.1%	0.0%	0.0%	0.0%
3.	Helped in clarifying the doubts	55.7%	40.0%	2.9%	1.4%	0.0%
4.	SGD was intresting and motivated you to learn Biochemistry	64.3%	35.7%	0.0%	0.0%	0.0%
5.	In understanding today's topic, SGD was very useful	58.6%	37.1%	1.4%	0.0%	2.9%
6.	Helped in answering MCQ	54.3%	42.9%	1.4%	0.0%	1.4%
7.	SGD method was better than the Didactic lecture method	58.6%	34.3%	2.9%	1.4%	2.9%
8.	Role of teacher was very important in SGD session	59.2%	40.8%	0.0%	0.0%	0.0%
9.	Like to have similar sessions in future	57.1%	38.6%	0.0%	0.0%	4.3%
10.	SGD should be included along with the regular lectures	65.7%	31.4%	1.4%	1.4%	0.0%

Topic: Lipid Chemistry & Metabolism

Instructions to student: Please give your opinion for each of the following objectives regarding your experience of small group discussion.

Table 1 gives the comparison of pre and post evaluation for Didactic Lecture of group A, which shows a significant improvement in the scores with post lecture (p=0.00). Table 2 gives the comparison of pre and post evaluation test for SGD of batch B, which shows a significant improvement in the scores with post SGD (p=0.00). Table 3 gives the comparison of scores obtained after post Lecture (batch A) and post SGD (batch B), which shows a significant improvement with post SGD of batch B. When it come to the perception of students, majority 78.6% students opined that SDG improved learning, remembrance, and performance in examination, 52.9% opined SGD increased thinking and communication skills, 55.7% opined SGD helped in clarifying the doubts, 64.3% opined that SGD was interesting and motivated you to learn Biochemistry, 58.6% opined SGD helped in understanding today's topic, 54.3%opined SGD was very useful and helped in answering MCQ, 58.6% opined that SGD method was better than the Didactic lecture method, 59.2% opined that the Role of teacher was very important in SGD session, 57.1%like to have similar sessions in future, 65.7% SGD should be included along with the routine lectures.

Discussion

When we compare the learning in larger groups with that of the smaller groups, learning is always better with the smaller groups as less are the number of the students in a group, more can be the attention given to them. This helps them to develop good communication skills and analytical/problem solving skills and[12-15] results of our study showed the method of teaching by structured group discussion is statistically highly significant over the method by didactic lectures. This study strongly supports the use of this method SGD in conjugation with traditional didactic lectures. Our results are also comparable to the ones obtained from the study by Hammed S et al[16] where the undergraduate medical students of one batch were taught by small group discussions (SGD), it was found that they performed better than their previous batches who were taught by traditional lecture methods. Similar results were also found in studies conducted by Tiwari A et al.[17] These findings may be considered in line with findings by Cendan et al in 2011, where in students reported more satisfaction with the small group teaching environment.[18] Regarding the feedback of the students, majority students agree that SDG improved learning, remembrance, and performance in examination, increased thinking and communication skills and SGD method was better than the Didactic lecture method.[19] Regular curriculum currently followed in under graduation for medical students can be slightly modified by including the small group discussions during the tutorial sessions. By making small group discussions compulsory, there can be an enhancement of the student's deeper learning.

Conclusion

Our study clearly indicates that, small group discussions help the student's to score better, when compared with that of regular lectures. Small group teachings offers active participation of learners, increases the teamwork ability, help in retention of knowledge and there by a helps in giving a better performance. It helps to increase the student- teacher relationship, which is proved to enhance the cognitive growth of the student.

Acknowledgement

The authors thank the Managing Directors of S.V.S Medical College and Hospital and Dean of SVSMC for overall motivation and support. We thank our Bio-Statistician for his help during the statistical analysis. The authors thank the support of the Medical Education Unit, SVSMC, Mahabubnagar and all the participants without whose cooperation our study was impossible.

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