

**EDUCATIONAL OUTCOMES OF SMALL GROUP DISCUSSIONS VERSUS TRADITIONAL LECTURE AMONG MEDICAL UNDERGRADUATES –A PROSPECTIVE STUDY**

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**ABSTRACT**

**Background :** Didactic lectures which are the usual method of approach in teaching a large group, turns to be a challenging task to promote active learning among the students. Small group discussions provides a unique environment which gives a scope for the activation of prior knowledge, to exchange the views among the group and is assumed to result in deeper learning. As a result, the learning can become more interesting for the students. Our objective is to compare the academic performance and retention capacity of students following small group discussions versus lecture and to assess the perception of students towards small group discussions. **Methods:** The study was carried out among first-year medical undergraduates. The 100 students were divided into two groups Group A & B, 50 in each group. Group A was exposed to regular lectures & Group B was exposed to Small Group Discussion sessions. Later a post-test was conducted, immediately & after 4 weeks of the lecture & Small group Discussion respectively. A cross over was done with another topic. Feedback was collected from all the students by administering a pre-validated Questionnaire. **Results :** Showed that the Post SGD group ( $15.34 \pm 3.62$ ) scored more in comparison with Post Lecture group ( $8.63 \pm 2.74$ ). Students reported a better learning experience and retention of the topic. 53% of the students strongly agreed, 45% agreed, 1% disagreed that SGD helped in their better performance. **Conclusion:** SGD's have facilitated a better understanding of the topic, which has been reflected in the student's performance. Thus, small group discussion sessions are more effective than traditional lectures.

**Keywords:** SGD- Small group discussion, DL- Didactic lecture

**INTRODUCTION**

The students are overburdened with increasing academic load, which is making learning painful instead a of delightful 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 as it promotes passive learning and fails to motivate the students (1). Biochemistry is having a lot of importance in understanding the clinical subjects. Clinical biochemistry basically deals with the methods and

interpretation of biochemical test results, performed on body fluids, which help us to support the clinical diagnosis, treatment and also in assessing the prognosis of the disease. But it is usually considered to be a subject of pathways and reactions. It is a need of the hour to make the students get involved in the learning process (2, 3). We made an attempt by introducing small group discussion sessions to discuss the clinical scenarios in a better way than with that of lectures. Small group discussions and case solving tutorials, enhances student-faculty interaction, improves communication skills (4, 5). It provides a learning environment which gives a scope for the activation of prior knowledge, helps to exchange the views among the group, thereby resulting in deeper learning (6, 7). As a result, the learning can become more interesting for the student. A shift from didactic lectures to small group teaching requires a change in the thought process of the learners and the teachers along with the availability of proper equipment and learning environment (8, 9). Our objective is to compare the academic performance and retention capacity of students following small group discussions versus lecture and to assess the perception of students towards small group discussions.

## **MATERIAL AND METHODS:**

The study was carried out from Oct 2017 to Jan 2018, in Department of Biochemistry, SVSMC, Mahabubnagar, Telangana state, after obtaining institutional ethical approval of S.V.S Medical College and Hospital. (SVAMC/IEC Approval No. 04/2017) and informed consent from all the participants has been taken. It's a Quasi-Experimental study design. First-year medical students were divided into two groups A, 50 students (Even roll numbers) and B, 50 students (Odd roll numbers). Heme synthesis and degradation will be the topic selected for these students. One week time was given to go through the topic on their own. SLO's (Annexure 1) and 4-5 case studies (Annexure 2) were provided to both the groups. A week later, about 5 lectures (1hr each) were taken for group A. After completion of lecture classes, group A was evaluated with the questionnaire (20 questions each

with 1 mark). The test scores post-lecture of group A was noted. After 4 weeks, the group A was reassessed with the same questionnaire, to test the retention capacity. Group B (50 students) were further divided into five sub groups, 10 in each subgroup. After a week the topic was discussed in the form of 5 small group discussion sessions over a period of 4 weeks. The facilitators made sure that all the group B participants are involved in the discussion. The facilitator guided the students to find a possible solution to the problem. Leading questions were asked by the facilitator, to make sure that the learning objectives were fulfilled. Students were encouraged to ask questions to the facilitator during the session. At the end of these sessions, the students were evaluated with the same questionnaire. The test scores of group B, post small group discussion were noted. The small group discussions were mainly based on quiz, debate and case study discussions. After 4 weeks, the group B was reassessed with the same questionnaire to test the retention capacity. Scores of group A were compared with the scores of group B. Later a cross over of the groups was done for another topic, Lipid metabolism. SLO'S and Case studies are given to both groups related to the topic. (Annexure 3 and 4) and the same procedure as above was followed. To evaluate the student's perception towards the small group discussions, a qualitative questionnaire with a Likert scale consisting of ten questions were given to both the groups. The questionnaire was validated before it was applied to the students (Table 2).

## **STATISTICAL ANALYSIS**

Data was analyzed by Graph pad prism software 6.01 version. Data was summarized by mean  $\pm$  SD for continuous data and percentages for categorical data. Comparison between two independent groups was done by unpaired 't' test / Mann-Whitney 'U' test. Perception of the students was described as proportions. All p values  $< 0.05$  were considered significant

## **RESULTS**

Table 1 shows that group B test scores post small

group discussion were higher ( $15.34 \pm 3.62$ ) when compared with the test scores of group A, post-lecture ( $8.63 \pm 2.74$ ). Retention capacity of group B (SGD) was more ( $15 \pm 16$  to  $11.5$ ) when compared to that with group A (lecture) ( $9 \pm 16$  to  $11.5$ ). After cross over the scores of group A, post SGD ( $14 \pm 11$  to  $17$ ) was more than with compared with group B, post-lecture ( $9 \pm 7.25$  to  $11$ ). Even the retention capacity of the students was greater with group A, post SGD ( $12 \pm 10$  to  $15$ ) when compared with that of group B, post-lecture ( $9 \pm 7$  to  $10$ ).

Table 2 and Figure 1 depict the perception of the students towards Small group discussions. 53% of the students strongly agreed, 45% agreed, 1% disagreed that SGD helped in their better performance. 67% of the students strongly agreed, 33% agreed that SGDs created motivation & enthusiasm to learn. 49% of the students strongly agreed, 48% agreed, 2% disagreed that SDG helped easy recollection of the subject. 54% of the students strongly opined and 46% of the students agreed that SGD helped in better clinical correlation. 69% of the students strongly agree, 29% agreed, 1% disagreed that SGD improved their communication skills. 46% of the students strongly opined, 52% agreed, 1% disagreed that SGDs were better than lecture. 49% strongly agreed, 28% agreed, 2% disagreed that the facilitator was effective during small group discussions. 68% of the students strongly agreed, 32% agreed to have similar sessions for other topics too. 57% of the students strongly agreed, 40% agreed, 3% were neutral with no opinion that SGD enhanced self-directed learning. 50% of the students strongly agreed, 48% agreed that SGD helped in better understanding of the subject.

## DISCUSSION

As per our results, it is evident that the small group discussions enhance the cognitive growth of the students. SGD's are more effective than the traditional Didactic lectures. Our finding was similar with the finding of Steinert Y et al (6), ForristallJ.etal (9) in their study. SGD's have facilitated a better understanding of the topic, which has been reflected in the student's performance. Students' cognitive skills have improved from performing simple tasks of

reciting, to just have a working memory, to that of higher order learning skills of critical thinking and retention capacity which helps them to analyze and solve the problems.

Our findings were similar to the findings of Curran VR et al, SharpeD et al, ForristallJ. et al (9) in their study related to small group discussion. Sharmila SR et al (10) reported that small groups can be an effective learning situation in which students learn from their teachers and interaction with each other. Our findings were concordant with the previous study report. Group discussion increased active participation of students as it was observed in our study; it makes more student-friendly than traditional teaching methods. It also helps self-directed learning and to exchange ideas. Similar findings were reported in the previous literature (11, 12).

## CONCLUSION

Students reported a better learning experience and retention of the topic. Besides this, the study infers that SGD's can have a positive impact on the student-teacher relationship. Improvements in learning strategy and self-efficacy of students were reflected in their improved academic performance. To conclude, the introduction of small group discussions as a part of the regular curriculum would be effective in improving students learning behavior towards deep learning, self-efficacy and also their academic performance.

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## REFERENCES

1. Sprawl sp. Evolving models for medical physics education and training: a global perspective. *Biomed Imaging Intervention J*. 2008; 4:e16.
2. West DC, Pomerory JR, Park JK, Gerstenberger EA, Sandoval J. Critical thinking in graduate medical education: a role of concept mapping assessment? *JAMA*. 2000; 284:1105-10.
3. Michael J. In pursuit of meaningful learning. *Advances in Physiology Education*. 2001; 25:145-58.
4. Jones RW. Learning and teaching in small groups: Characteristics, benefits, problems, and approaches. *Anaesth Intensive Care*. 2007; 35(4):587-592.
5. Jones R. Teaching and Learning in Small Groups: characteristics, benefits, problems, and approaches. *Anaesthesia and intensive care*. 2007; 35:587-92
6. Steinert Y. Student perceptions of effective small group teaching. *Med Educ*. 2004; 38(3):286-93
7. Khan I FA. Problem-Based Learning Variant: Transition phase for a Large Institution. *JPMA*. 2001; Aug; 51(8):271-4
8. Bennett J, Hogarth S, Lubben F, Campbell F, Robinson A. Talking Science: The research evidence on the use of small group discussions in science teaching. *International Journal of Science Education*. 2010; 32(1):69-95
9. Curran VR, Sharpe D, Forristall J. Students at is faction and perceptions of small group process in case-based interprofessional learning. *Med Teach*. 2008; 30(4):431-3.
10. Sharmila SR, Mungal SU, More SR. Developing competencies of medical students using group discussion as TL method. *IOSR J Dent Med Sci*. 2014; 13:24-7.
11. Sajjad S. Effective teaching methods at higher education level. *Pak J Spec Educ*. 2010; 11:29-43.
12. Gopalakrishnan P, Swati Patki, Varghese SS, Harsha CH, Antony R. Effectiveness of different methods of education among first-year medical students in Central Kerala. *Int J Med Pharm Sci*. 2014; 5:01-4.

## TABLES

Table 1: Showing the Post test scores of (Lecture & SGD) both A & B groups in the form of Range, Mean, Median, Interquartile range (IQR), Standard deviation (SD) and p - value

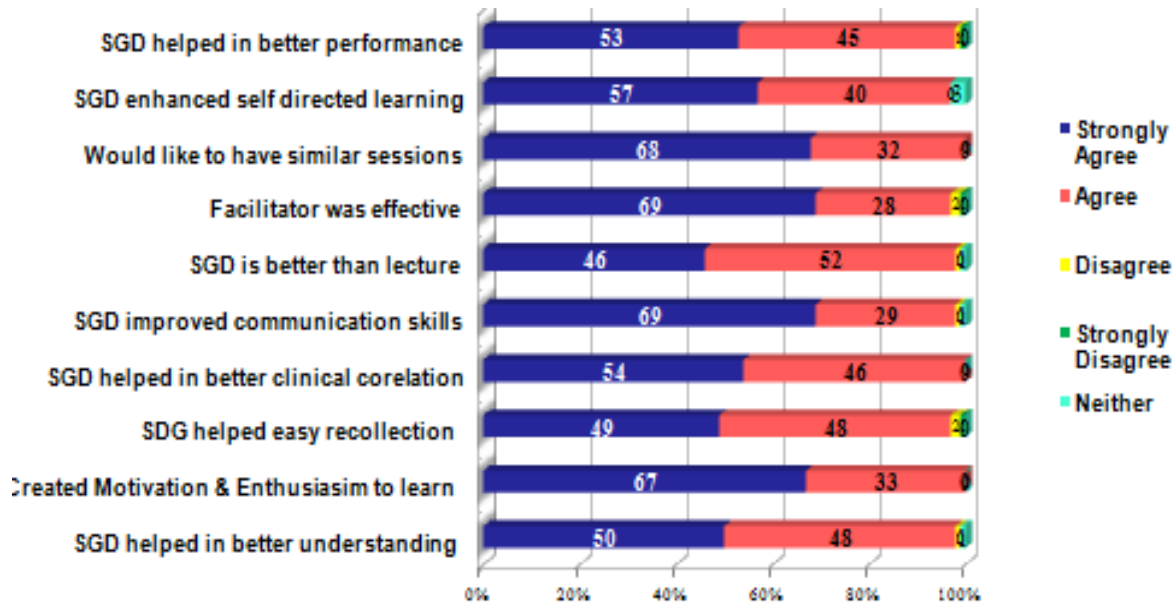
Sessions	Groups	Range	Mean	SD	P-value
<b>First session</b>	A Lect	2 to 13	8.63	2.74	<0.0001
	B SGD	8 to 20	15.34	3.62	
Sessions	<b>Groups</b>	<b>Range</b>	<b>Median</b>	<b>IQR</b>	<b>P-value</b>
<b>After 4 Weeks</b>	A Lect	3 to 13	9	10 to 7	<0.0001
	B SGD	8 to 20	15	16 to 11.5	
<b>Cross over Second session</b>	A SGD	8 to 20	14	11 to 17	<0.0001
	B Lect	4 to 13	9	7.25 to 11	
<b>After 4 Weeks</b>	A SGD	8 to 20	12	10 to 15	<0.0001
	B Lect	4 to 13	9	7 to 10	

**Table 2:** Showing the Comparison of Likert scale responses - Perception (feedback) of students towards SGD through feedback Questionnaire

Sl.No.	Content	Strongly Agree	Agree	Disagree	Strongly Disagree	Neither
1.	SGD helped in better performance	53	45	1	1	0
2.	Created Motivation & Enthusiasm to learn	67	33	0	0	0
3.	SDG helped easy recollection	49	48	2	1	0
4.	SGD helped in better clinical correlation	54	46	0	0	0
5.	SGD improved communication skills	69	29	1	0	1
6.	SGD is better than lecture	46	52	1	0	1
7.	Facilitator was effective	69	28	2	1	0
8.	Would like to have similar sessions	68	32	0	0	0
9.	SGD enhanced self-directed learning	57	40	0	0	3
10.	SGD helped in better understanding	50	48	1	0	1

## FIGURES

**Figure 1: Comparison of Likert scale responses - Perception (feedback) of students towards SGD through feedback Questionnaire**



## APPENDICES

### Annexure 1:

#### Specific learning objectives: Students should be able to

1. Describe the structure, functions and types of Hemoglobin
2. Add a note on mechanism of blood gas transport
3. Importance of Bohr's effect and 2,3 – BPG
4. Describe Hemoglobinopathies (Sickle cell anemia, Thalassemias)
5. Note on Heme biosynthesis
6. Classify and mention the salient features of Porphyrias
7. Note on Heme degradation
8. Define and mention types of Jaundice
9. Describe congenital hyperbilirubinemias

### Annexure 2:

#### An example of Case Based Modules discussed .

1. A 16 year old African girl was admitted to the emergency room with complaints of fever and recurrent body pains.

On examination, hepatosplenomegaly was detected

Her laboratory tests revealed the following:

Hemoglobin : 6.5 g/dl

Hematocrit : 9.1%

Serum iron : 11µg/dl

Serum albumin: 4.4 g/dl

Microscopic examination of blood smear revealed: Target cells, poikilocytes, hypochromasia, sickle red cells, nucleated RBCs and Howell-jolly bodies



Hb electrophoresis: shows a distinct HbS band with slower movement than that of adult haemoglobin (HbA1)

What is the probable diagnosis?

2. Interpretation of laboratory data

The following are some of the findings of biochemical investigation in a patient:

Van den Berg reaction      indirect positive

Total bilirubin              11.4 mg%

Conjugated bilirubin        0.6 mg%

Unconjugated bilirubin    10.8 mg%

What is your probable diagnosis?

**Annexure 3:**

**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  $\beta$ - oxidation of FAs
9. Note on FA synthesis
10. Note on Lipid storage disorders
11. Note on Hyper and Hypo lipoproteinemias

**Annexure 4:**

**An example of Case based modules:**

1. A 25 year old woman presented with a history of hepatosplenomegaly with eventual removal of spleen, bone and joint pains with several fractures of femur. A liver biopsy that shows wrinkled looking cells with accumulation of glucosyl ceramide.

What would be the likely diagnosis of this patient?

2. A 60 year old female presented with recurrent mid epigastric pain over the last 3 months. She reported some relief of epigastric pain shortly after eating, but then discomfort returned. She was on increased amount of ibuprofen dose needed for relief of her arthritis. On examination she was pale with no jaundice, pulse and BP were normal. Had mild epigastric tenderness. CBC revealed normal. Patient was referred to gastroenterologist who performed an upper GI endoscopy that identified gastric ulcers. He suspected that ibuprofen, a NSAID was the causative agent and suggested switching from ibuprofen to COXibs, like celecoxib.

What is the biochemical etiology of this disorder?

Why NSAID was changed to Celecoxib?