

SMALL GROUP DISCUSSION- IMPACT ON STUDENT`S TEST SCORES IN AN UNDERGRADUATE PATHOLOGY COURSE

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ABSTRACT

Objective:

To determine the impact of small group discussion (SGD) on undergraduate learning in Pathology as reflected by student`s test scores.

Study design:

Quasi Experimental study

Context and setting: Fourth year undergraduate students attending pathology course at University Medical and Dental College, Faisalabad in year 2012

Methods:

Musculoskeletal system was taught using small group discussions as the main instructional tool. No lectures were taken on this topic before or during the session. A written test comprising of both multiple choice questions (MCQ) and short answer questions (SAQ) was conducted one week after completion of the topic. The results of this test were compared with those of the previous session (historical control), where the same system was taught in a traditional way with lectures. The data was analyzed using SPSS version 17. T-test was used to determine the difference in scores. P-value of <.05 was taken as significant.

Results:

Students taught by SGD scored significantly higher on musculoskeletal system test as compared to previous batch. Their mean scores on both MCQs and SAQs were significantly higher than students taught by didactic lectures.

Conclusion:

Small group discussions lead to better cognitive learning as compared to lectures, when compared in terms of test scores.

Key words: Small group discussion, Undergraduate, medical education, Basic sciences, pre-clerkship.

INTRODUCTION

Small group discussion provides a unique environment to achieve high standards in medical education¹. Activation of prior knowledge, exchange of ideas, and engagement at a higher cognitive level are assumed to result in deeper learning and

better academic achievements by students^{2,3}. Transition from lecture based teaching into small group teaching requires a basic development in the curriculum and training of the educators. This also needs a change in the opinion of the learners and the teachers along with more trained experienced staff and the availability of proper equipment and environment^{4,5}. Well established in higher education, SGD is ineffectively utilized in traditional undergraduate curricula in Pakistan.

Assessment scores are generally considered to be the most valued measure of the learning

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process by all stake holders. Fear of not getting good scores is a major concern when it comes to adopting innovative methods of teaching and learning. Interactive learning in small groups has been evaluated more positively than formal lecturing by medical students and medical professionals alike⁶. Literature strongly supports small group learning for engagement of students in a deeper and more meaningful learning⁷ but not in terms of better scores^{4,8}. This study was undertaken to determine the impact of SGD on cognitive learning in terms of assessment scores so that both teachers and students feel more confident while adopting SGD as an educational format.

METHODS

Musculoskeletal system used to be taught in a traditional manner by didactic lectures in 18 hours over 8 weeks. Three practical sessions were also conducted to cover gross and microscopic features of bone tumors, using specimens and histopathology slides. In 2012, it was decided to teach the same system through small group discussions instead of lectures, as a pilot project. Lectures were totally replaced with SGD, keeping the practical sessions as they were. Department of medical education arranged a workshop on small group facilitation for capacity building of faculty members in Pathology department. During that workshop the faculty members in addition to other activities also developed the evaluation forms for students (appendix I) and the ones on which they were to be evaluated by the students (appendix II). Musculoskeletal system was divided into 7 sub topics. The faculty members prepared the topics in 4 weeks and rehearsed them with one person role playing as the facilitator⁹. One hundred students of fourth year MBBS were divided into ten batches of ten students each. They were first introduced to SGD as an instructional strategy and their role and responsibilities as learners were clearly outlined. The subtopics with the schedule were displayed on notice board. The students were supposed to come prepared with the topic of discussion on that particular day. There was an open student led discussion,

with the facilitator monitoring group dynamics. At the end of each session there was an assessment with 10 MCQs on the same topic. The facilitator evaluated each student on a questionnaire and the students evaluated their facilitator and the session on the whole. The students remained in the same batches whereas the facilitators rotated in each session. The session lasted for 90 minutes followed by a short talk by a clinician highlighting the clinical relevance of the topic. Musculoskeletal system was covered in 7 SGD sessions over 7 weeks. Student's learning was assessed by a written test comprising of 20 MCQs of single best or A-type and 6 SAQs, conducted one week after completion of these sessions. The questions were randomly selected from the pool as every year and all were problem based. Ninety nine students appeared in that test. The scores of this test were compared with the scores of 99 students from previous batch (2011) on a similar written test on musculoskeletal system taking them as historical control. The control batch was taught musculoskeletal system by lectures as the main instructional tool. The data was analyzed using SPSS version 17. T-test was used to statistically measure the difference and p value $< .05$ was taken as significant.

RESULTS

In the SGD group 95.95% of students passed the test (50% being the passing score), whereas 72.72% of students in the lecture group could pass a similar test ($p < .000$). Students in SGD group achieved significantly higher scores in both MCQs and SAQs as compared to students in the lecture group. Comparison of means for percentage total score, percentage MCQ score and percentage SAQ score is shown in table I.

DISCUSSION

Comparison of learning in small group and large group formats has been an important focus of educational research in the recent past. There is a general consensus about better learning in small groups in terms of deeper understanding, critical thinking,

problem solving skills⁶, and better student satisfaction^{10,11,12} but not in terms of factual knowledge and assessment scores^{4,8}. Majority of these studies used PBL as the small group format. In our study we used free discussion groups led by students. In a randomized trial comparing group discussions with didactic lectures in undergraduate orthopedics rotation carried out at Cambridge University Clinical School, students attending group discussions significantly outperformed those attending didactic lectures on a written test comprising of SAQs¹³. In our study the students using small group discussions scored significantly better on both SAQs and MCQs.

In another study with third year clerkship students in University of Central Florida School of medicine, surgical curriculum was delivered by 8 SGD sessions instead of 33 lectures¹⁴. Student`s performance on National Board of Medical Examiners surgery exam was significantly better in terms of raw scores and percentile ranks than that of the previous class taught by traditional large group teaching.

Many studies comparing learning in small groups particularly Problem based sessions and large groups in terms of student scores state that learning is as effective in small group as in large group⁴. A study conducted at Fatima Jinnah Medical College, Lahore with final year students revealed the same results⁸. Some studies even reveal that students studying in conventional curricula score better than students receiving problem based curricula¹. This is in contrast to our study. One reason for this may be that all questions

in our assessment were problem based i.e. C3 level. Literature strongly supports the notion that SGD results in developing better and deeper understanding and thus better problem solving skills in students¹⁵ as compared to traditional teaching methods¹. Traditional curricula currently followed in pre clerkship years have allocated time for tutorials. However this time is generally wasted in didactic teaching with a smaller number of students rather than an interactive small group format. We strongly suggest proper use of this tutorial time for interactive SGDs. This will facilitate the transition from a traditional to Hybrid curricular models¹ strongly recommended for contexts like ours.

LIMITATIONS

This study involved participants from only one private sector medical college and all were girl students. These factors along with use of historical control limit the generalization of this study`s results.

CONCLUSION

Despite limitations, the results of our study clearly indicate that small group discussions lead to better cognitive learning as compared to lectures, in undergraduate basic science students, when compared in terms of test scores. Using the tutorial time for interactive SGDs can lead to better student performance in exams.

Table I. Comparison of assessment scores in class tests on musculoskeletal system taught by SGD (2012) and Lectures (2011) using t-test

variable	Instructional tool	Mean	SD	p-value
Percentage total score	SGD	64.29	10.74	.000
	Lectures	55.72	11.15	
Percentage MCQ score	SGD	69.04	11.80	.000
	Lecture	56.01	13.00	
Percentage SAQ score	SGD	60.85	13.36	.004
	Lecture	54.86	15.29	
Percentage of students passing the test	SGD	95.95		.000
	Lecture	72.72		

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Appendix 1**Facilitator`s evaluation of student`s performance in SGD session**

Sr. No	Behavior	Strongly disagree	Disagree	Agree	Strongly agree	Total
1	Well Prepared for the session					
2	Was punctual					
3	Participated actively					
4	Demonstrated good Communication skills					
5	Helpful attitude as a group member					

Appendix II**Student Evaluation of the SGD Facilitators for 4th Year MBBS – UMDC****Date:****Topic:****Facilitator:** _____**INSTRUCTIONS TO STUDENT:**

Below are a number of behavior or characteristics of facilitators. **Please CIRCLE "1"** if your facilitator's behavior in this dimension was helpful to your learning or the group process; **CIRCLE "2"** if it was unhelpful; and **CIRCLE "NA"** if the occasion did not arise for demonstration of this behavior.

1 _____ 2 _____ NA

Helpful**Not helpful****Not Applicable**

- | | | | |
|---|---|---|----|
| 1. Encouraged thinking, inquiry, and critical reasoning..... | 1 | 2 | NA |
| 2. Encouraged a safe environment to express ignorance/ideas without any fear..... | 1 | 2 | NA |
| 3. Demonstrated sensitivity and respect for students..... | 1 | 2 | NA |
| 4. Provided feedback when appropriate..... | 1 | 2 | NA |
| 5. Facilitated participation of all members of the group..... | 1 | 2 | NA |
| 6. Refocused the group when discussion was wandering..... | 1 | 2 | NA |
| 7. Encouraged student responsibility for the process..... | 1 | 2 | NA |

For questions 8 – 10 use following scale:

Very Low 1 2 3 4 5 Very High

Global:

- | | | | | | |
|--|---|---|---|---|---|
| 8. Overall effectiveness of the facilitator..... | 1 | 2 | 3 | 4 | 5 |
| 9. Overall value, to me, of these sessions..... | 1 | 2 | 3 | 4 | 5 |
| 10. The clinical relevance of what I have learned in this session is | 1 | 2 | 3 | 4 | 5 |

Open Ended Comments:

11. Please describe any strength or weakness of this session. Include any ideas about how these sessions can be improved. (you may use the reverse side if necessary)