

**A COMPARISON OF COLLABORATIVE LEARNING WITH INDIVIDUAL LEARNING IN RETENTION OF KNOWLEDGE TAUGHT IN ETHICS AND PROFESSIONALISM CLASS OF GENERAL MEDICINE**

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**ABSTRACT:** With healthcare services in India coming under the consumer protection act, the cases of law suits against doctors are increasing every day. Training our students in ethical conflict resolution is very important in addressing this problem. The teaching modules for training students in ethical conflict resolution are to be tested before implementation. In this study we tested a module for teaching ethical conflict resolution to final MBBS medical students by comparing retention of knowledge by collaborative learning with individual efforts at learning. **MATERIALS AND METHODS:** We included 38 students of final MBBS after obtaining informed consent and delivered an interactive lecture on resolving ethical conflicts using Davidson's principles and practice of medicine which is a prescribed textbook for medical undergraduates of our university as a resource material. Pre and post tests were conducted to assess the understanding. Subsequently the students were divided into two groups. Group 1 was given a short break after which the students wrote a long essay answer to solve an ethical case scenario for 10 marks. Group 2 had a group discussion to solve the same case scenario after which they answered the long essay question. Feedback was obtained from both the groups about the teaching learning activity. The long essay answers were assessed by two independent examiners and the performance of students in both the groups was compared. **RESULTS:** The students were divided into 2 groups by alternate number allocation. Both the groups were comparable in their posttest performance. Group 1 wrote the answer to the long essay by individual effort. The average marks for this group was  $5.95 \pm 1.25$ . Group 2 answered the long essay question by collaborative learning and had an average score of  $6.95 \pm 1.23$ . There was a significant difference between the two groups with the unpaired t test being 2.48 and p value  $< 0.05$ . The inter-rater reliability for the examiners was found to be  $\text{Kappa} = 0.42$  ( $p < 0.0001$ ) suggestive of moderate agreement. Many students expressed satisfaction with the teaching module. The students from group 1 predominantly liked the module as a way of sensitising about an important issue. The students of group 2 liked the module as a way of collaborative learning. Both the groups opined that inclusion of role plays, videos, integrated interdisciplinary teaching and other tools could be used to improve the learning. **CONCLUSION:** Collaborative learning is more effective in retention of knowledge in comparison to individual efforts for teaching principles of ethical conflict resolution. **KEYWORDS:** Ethics, group discussion, collaborative learning, conflict resolution.

**INTRODUCTION:** There is no doubt that ethics teaching is important for the students of medicine. The teaching of ethics in general medicine is limited to few classes.

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This has been reviewed and changes are planned to be introduced in the curriculum incorporating ethics teaching from the first year itself.<sup>1</sup> the curriculum and its teaching –learning method itself is still in the formative process.

Previous reports that student performance is enhanced by collaborative learning is confirmed in previous studies.<sup>2,3</sup> Collaborative peer exercise aids critical reasoning, immediate feedback from peers, active participation and responsibility towards own learning. The process of working in a group itself becomes a part of the learning. It is said that one of the goals of the ethics and professionalism classes is to reconcile differences between personal and professional values.

Medical ethics teaching includes the teaching of moral reasoning skills, the instruction about relevant ethical knowledge, and the development of certain character traits.<sup>4</sup> Gaining ethical knowledge and moral reasoning skills may be accomplished by training in groups, but the development of character traits requires reflection individually. So we set out to compare the retention of knowledge by medical students in group discussions versus individually after an interactive lecture in professionalism and ethics in a general medicine class.

**MATERIALS AND METHODS:** After obtaining permission from the institutional review board and the head of our institute, 40 final MBBS students posted in general medicine rotation were recruited for undergoing training in resolution of ethical conflicts. Written informed consent was taken. Among them 2 students could not participate due to their absence. Out of 38 students, 24 were from regular batch and 14 were repeaters who needed an extra attempt to pass in their previous phase. A lecture on principles of resolution of ethical conflicts with 1st chapter of Davidson's textbook of principles and practice of medicine as a resource<sup>5</sup> was delivered to all the students [n=38] over 40 minutes. They underwent a pretest and posttest carrying 10 marks to evaluate the prior understanding of subject and the impact of the lecture. The multiple choice questions in pre and posttest were limited to assess recall. The specific learning objectives for the lecture were as follows:

**At the end of the lecture the students should be able to:**

- Understand the need for training in clinical ethics.
- Enlist the types of ethics and the situations where ethics is applicable in medicine.
- State the principles governing clinical ethics.
- Identify the causes for ethical conflicts.
- Apply the ethical analysis approach to solve ethical problems.

During the next part, they were divided into two groups by counting alternate numbers and sent to separate classrooms. Both the groups were given a hypothetical ethical case scenario to solve the ethical conflict by applying the principles taught in the lecture. In the 1<sup>st</sup> room, the ethical problem was asked to be solved by individual effort. They were given a break of 20 minutes and then 15 minutes to write a long essay reflecting on the case scenario effectively. In the second room, a small group discussion was conducted for solving the same case scenario by group 2 for 20 minutes. No assistance was provided except the place, chalk and board. The proceedings of the small group discussion were observed and noted by a neutral observer. The conversations were recorded. The subsequent 15 minutes were provided for writing a long essay reflecting on the same case scenario.

The long essays were assessed for 10 marks and by 2 examiners independently, one being an author of this study and the other an independent teacher from another department proficient with

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medical ethics. Feedback about the learning experience was obtained in the form of 6 open ended questions.

**STATISTICAL METHODS:** Mean pretest and posttest scores were calculated with standard deviation. Paired 't' test was applied to see the difference between the pre & posttest marks. Similarly mean values for scores in long essay written by group 1 and 2 were calculated and tested by unpaired t test for comparison. An interrater reliability analysis using the Kappa statistic was performed to determine consistency between the 2 examiners.

**RESULTS:** The mean pretest score was  $5.84 \pm 1.44$  and post test score was  $7.63 \pm 1.10$ . This difference attributable to the lecture was significant. There was improvement in post-test scores of both repeaters and regular students. However the difference in test scores of repeaters was higher. The summary of performance in pre and posttests is depicted in table 1. The two groups formed after the posttest were comparable in their mean scores in posttest with group 1 having an average score of  $7.56 \pm 1.20$  and group 2 having an average score of  $7.61 \pm 1.23$ . This meant that both the groups had similar understanding of the lecture. The two groups were then asked to write a long essay after individual effort or after a group discussion. There was a significant difference in application of knowledge and analysis observed in group 2 who had a group discussion following the lecture. Analysis of performance in long essay by group I and group II (Average marks awarded by examiner I & examiner II) is depicted in table 2. The examiners who assessed the long essay for 10 marks were equipped with an answer key.

The inter-rater reliability for the examiners was found to be  $Kappa=0.42$  ( $p<0.0001$ ) suggestive of moderate agreement. Agreement between examiner 1 and examiner 2 in assessment of performance in long essay by Kappa score is seen in table 3. In their feedback on what they liked in the teaching learning activity, 9 (n=19) students from group 1 expressed that being sensitised to the principles of ethics and methods to resolve ethical conflicts was the most important aspect of their learning activity. In the same group 8 (n=19) students liked the interactive lecture. On the other hand 12 (n=19) students of group 2 expressed that group discussion was the most important aspect of their learning activity. They expressed that the group activity generated ideas by collective thinking due to pooling of ideas from people of different backgrounds. They expressed that it enhances respect for peers and removes bias. Their views are seen in table 4. In their feedback on what they did not like in the teaching learning activity, curiously 9 (n=19) students from group 2 expressed that there was a need to improve some aspects of the module in comparison with 7 students of group 1. Their opinions are seen in table 5.

**DISCUSSION:** There is a need for explicit curriculum for teaching principles of ethical conflict resolution. In our country ethics and professionalism are learnt by observing the role models as a hidden curriculum. Introduction of any new teaching module should be evidence based to address constraints in the form of requirement of staff, infrastructure and time while delivering content that is relevant and interesting. This module used the resource material recommended by our university and was not demanding in infrastructure, time or staff requirement. Collaborative learning helps in pooling of ideas from several persons of different origins and can generate solutions to new problems. The learning activity itself teaches respect for others.

These issues are very important when the student faces ethical conflicts in the future to enable him to seek help and opinion of his colleagues. Group discussion is an effective tool to retain

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knowledge, to develop critical reasoning skills, to generate solutions to difficult situations and to enhance communication skills which are all vital professional attributes.

**CONCLUSION:** The sequential lecture→break→group discussion→testing by long essay question is better than lecture→break→reflection→testing by long essay question to retain knowledge and enhance analytical abilities in students learning ethics and professionalism.

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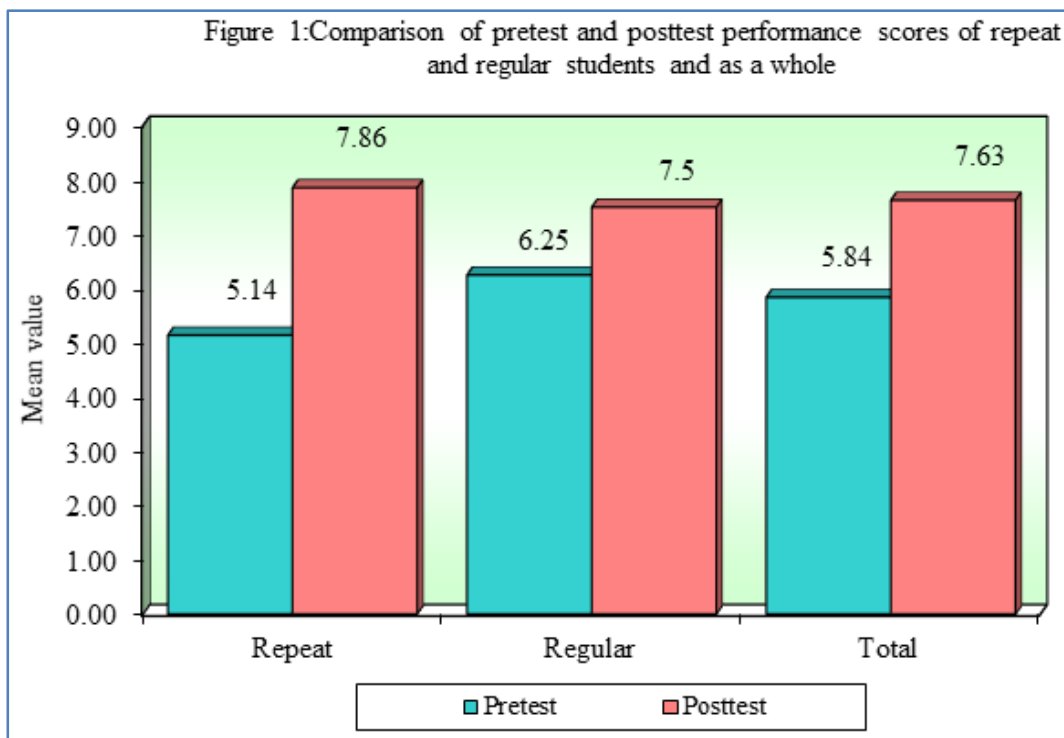
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Students	Time	Mean	Std. Dv.	Mean Diff.	SD Diff.	% of change	Paired t	p-value
Repeaters [n=14]	Pretest	5.14	1.46	-2.71	2.27	-52.78	-4.4783	0.0006*
	Posttest	7.86	1.23					
Regular students [n=24]	Pretest	6.25	1.29	-1.25	1.70	-20.00	-3.6014	0.0015*
	Posttest	7.50	1.02					
<b>Total [n=38]</b>	<b>Pretest</b>	<b>5.84</b>	<b>1.44</b>	<b>-1.79</b>	<b>2.03</b>	<b>-30.63</b>	<b>-5.4368</b>	<b>0.0001*</b>
	<b>Posttest</b>	<b>7.63</b>	<b>1.10</b>					

Table 1: Comparison of pre-test and post-test performance scores of repeat and regular students and as a whole batch by paired t test

\*p<0.05

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	N	Average marks awarded by Examiner I & Examiner II Mean $\pm$ SD	Unpaired 't' test	P value
Group I	19	5.95 $\pm$ 1.25	2.48	0.018*
Group II	19	6.95 $\pm$ 1.23		

Table 2: Analysis of performance in long essay by group I and group II (According to average marks awarded by examiner I & examiner II)

There was a significant difference between group I & group II marks.

Groups	Agreement	Expected Agreement	Kappa	Std. Err.	Z-value	p-value
Group 1	77.78%	69.51%	0.2713	0.1421	1.9100	0.0281*
Group 2	87.50%	74.08%	0.5177	0.1228	4.2200	0.0001*
Total	84.65%	73.43%	0.4222	0.0943	4.4800	0.0001*

Table 3: Agreement between examiner 1 and examiner 2 in assessment Of performance in long essay by Kappa statistic.

\*p<0.05

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	Group I	Group II
Application in future patient encounters	01	00
Appreciation for teaching communication skills	01	00
Collective decision makes options acceptable	01	00
Generates ideas	03	06
Group activity removes bias	01	00
Interaction generates new ideas	01	00
Learning with examples	01	00
Sensitization	06	00
Sharing of ideas	02	00
Taught advocacy for patient	01	00
Vague	03	01
Cleared wrong concepts	00	01
Collective thinking	00	05
Discussion enhances collective thinking process	00	01
Discussion, active learning, respect for peers	00	01
Legal aspects were taught	00	01
Pooling of ideas from people from different backgrounds	00	01

**Table 4: Analysis of feedback regarding what the students liked about the module (numbers represent the number of students with similar opinions)**

	Group I	Group II
Approaches for ethical conflict resolution were difficult to understand	01	00
Legal aspects needed more discussion	01	00
More examples & role play were needed	01	00
Need for better examples	01	00
No replay or video	02	00
should be taught at the beginning of clinical postings, should be conducted regularly, revision of content regularly	01	00
Essay writing	00	01
Low interaction of some members of the group	00	01
Need for reinforcement is there	00	01
Pre-test & long essay were cumbersome	00	03
Short duration, lack of preparation by students	00	01
Teaching by interdisciplinary integration including lawyers & interaction with patients could improve the module	00	01
Too little time, no previous exposure	00	01
Module was satisfactory	14	07

**Table 5: Analysis of feedback about what the students did not like about the module (numbers represent the number of students with similar opinions)**

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