

An interventional approach “Jigsaw method” in combination with a lecture to improve the understanding of Clinical Microbiology for second MBBS students

A.Swathi,¹ H.R.V.Rajkumar²

¹Assistant professor, ²Professor and Head, Department of Microbiology, Kamineni Academy of Medical Sciences and Research Centre, LB Nagar, Hyderabad, Telangana state

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Abstract:

Introduction: The Medical Council of India (Vision 2015) as well as The ‘SPICES’ model of medical curriculum categorically emphasizes self-directed learning and encourages learner centric approaches. The Jigsaw method is a form of cooperative learning, in which students are actively involved in the teaching-learning process. Active engagement of learners has shown to improve long-term retention of acquired knowledge. In Medical Microbiology, students often feel difficulty in understanding, comprehending and interpreting the clinical case scenarios. Therefore the present study was conducted to evaluate the effectiveness of “Jigsaw method” in combination with lecture to improve the understanding of Clinical Microbiology for second MBBS students and to assess the students’ knowledge in understanding clinical microbiology case scenario by pre and post test questionnaire.

Methods: The study was conducted with 75 students and 4 faculty members. A topic was selected and the content was prepared. The topic was initially taught by lecture and after one week the students were put for the intervention “Jigsaw”. The pretest and post test was conducted and feedback was collected from both the students and faculty.

Results: There was a significant improvement in the posttest scores of the students after Jigsaw. 28% of the students scored >75% in the pretest while 78.6% of the students scored >75% in the post test .Both the students and the faculty gave a satisfactory feedback based on the Likerts rating scale.

Conclusion: Traditional didactic lecture method needs to be complemented by interactive method like Jig Saw to facilitate learning among medical students.

Keywords: Jigsaw method, interventional approach, Medical Microbiology

Introduction:

The ‘SPICES’ model of medical curriculum recommends a paradigm shift from teacher-centered to student-centered learning. ¹The Medical Council of India (Vision 2015) also emphasizes self-directed learning and encourages

learner centric approaches.² Active engagement of learners has shown to improve long-term retention of acquired knowledge.

Incorporation of active learning strategies like “Jigsaw method “into conventional passive learning approaches has resulted in improved students’ performance. The Jigsaw method(JT) is a form of cooperative learning, in which students are actively involved in the teaching-learning process.¹

Address of Correspondence:

Dr.A.Swathi
Assistant professor, Department of Microbiology,
Kamineni Academy of Medical Sciences
and Research Centre, LB Nagar, Hyderabad- 500068,
Telangana state
Email id: drswathi.gurajala@gmail.com

According to Aronson and Patnoe, Jigsaw, is a well-established method for encouraging group sharing and learning of specific content. This technique is used as an instructional activity across several days and is best to use when there is a large amount of content to teach. Furthermore, James states that in small group work and cooperative learning, students learn best when they are actively involved in the process.³ Researchers report that, regardless of the subject matter, student working in small groups tend to learn more of what is taught and retain it longer than when the same content is presented in other instructional formats.⁴

However, a literature search returns limited evidence of its use in medical education.

The present study was taken with an objective to study the effectiveness of “Jigsaw method” in combination with lecture in enhancing cognitive skills in clinical microbiology and to assess the student perception towards cooperative group activities.

MATERIAL & METHODS

A quasiexperimental study was conducted after the Institutional ethical committee clearance was obtained. The study was conducted by the Department of Microbiology in a tertiary care teaching hospital.

The Study population selected was second MBBS students comprising of 75 students. Student consent was taken for their participation in the study.

METHODOLOGY:

The faculty of the Department was sensitized about the Jigsaw methodology. The topic selected “Pyrexia of unknown origin” and the required content was prepared by the faculty. The topic was initially taken as a lecture for all the students. For “Jigsaw”, 3 sessions were conducted comprising of 25 students each after 1 week. Pretest, posttest questionnaire in the form of MCQs and feedback forms were prepared.

The students were divided initially into 5 “home groups” comprising of 5 students and then sub grouped into “expert groups” as depicted in the figure 1. Pretest was conducted. The content was provided to the expert groups. After discussion, the expert group again joined their home groups and presented to each other. Post test was conducted and feedback was taken from the students and faculty.

Statistical analysis was done by chi square test.

RESULTS:

75 students participated in the study.

Pretest, post test results and feedback collected were analyzed.

The students post test score were significantly improved after Jigsaw compared to lecture. (Figure 2). 28% of the students scored >75% in the pretest while 78.6% of the students scored >75% in the post test. P value was < 0.05

The students strongly agreed that jigsaw was helpful for them in understanding the topic in detail. The satisfaction level was calculated as 72-94% on likerts scale based on questionnaire given. (Figure 3)

The faculty also strongly agreed that jigsaw method can be included in the interactive teaching sessions to complement the lecture. (figure4)

Discussion:

The primary objective of teaching in medical education is the development of clinical competency and training successful and empowered graduates with professional competency so that they can use knowledge for problem solving in their careers. MCI vision 2015 envisages that the Indian Medical Graduates will have the necessary competencies (Knowledge, Skills and Attitudes) to assume his or her role as health care providers. Hence the modifications have been made in the existing curricula to accommodate the aspirations of the defined goals,

competencies and greater emphasis on cooperative learning.⁵

The dominant teaching strategy is lecture in most of the colleges and existing data says that 80% of educational content is forgotten within 8 weeks using this method.⁶ Teachers like to use lecture because it can be applied in large classes. Factors such as high volume of educational topics, time limit, lack of need to particular physical space and implementation in large classes are among the main reasons why teachers prefer to use lecture method. However, it is the one-way training and can quickly become boring and prevent effective learning of students. So interactive teaching sessions can be planned especially for small groups to maintain the interest in the students. Such student-centered teaching models categorized by Joyce and Weill emphasize on the formation of learning groups, working together and collaboration, effective communications, energy generation and that the teacher manages the class using collaboration.⁷

In our study, we have observed that the post test scores significantly improved after the JT. Srivastava, et al. studied effect of interactive intra group teaching, where they found significant difference in the post-test scores by interactive method as compared to traditional teaching method.⁸ Saleh, et al. compared didactic lectures with interactive sessions in small group teaching and found that students in interactive sessions, performed better. They also found a positive attitude among students toward interactive sessions.⁹ Pragnesh parmar et al also observed that there was significance increase in mean post test score for the innovative teaching methods for all topics.¹⁰

According to Vinod kumar et al the evaluation of the Jigsaw method of teaching by Kirkpatrick evaluation framework suggests that Jigsaw is an effective teaching-learning tool and has an impact on the learning outcome among the students and is acceptable to them.⁶

In the present study we took the students feedback by a questionnaire and we found that students have taken up this interventional approach with a positive attitude. Many students were of the opinion that this type of sessions should be conducted more often. Lakshmi R also reported that Jig saw technique was found to be effective in teaching students.¹¹ Bassendowski and Petrucka employed the jigsaw strategy at the University of Saskatchewan and their study demonstrated that this approach was highly effective in generating and delivering comprehensive information from and to the students.¹²

Eldin studied the effectiveness of the jigsaw strategy on student participant's learning at Damanhour University and showed that the students gained knowledge from the interactive learning process.¹³ The study showed that the students enjoyed the method and that the approach was effective in improving the academic scores of the students.

Persky and Pollack assessed the use of jigsaw approach in teaching renal clearance concepts among a group of medical students and showed that the jigsaw approach was successful in enabling learning among students.¹⁴

In general we observed that "When you teach, you learn twice". Jigsaw Promotes student's motivation in learning, Develops positive attitude, Develops interpersonal skills, develops self-confidence communication among students , student support , logical thinking, ability in problem solving, motivation , and critical thinking. The student's attention is more focused. Slow learners will be benefited

The faculty was also of the opinion that Jigsaw has to be incorporated in to the existing teaching

But there were a few limitations like the study could be conducted only on one topic, only half of the batch of 150 students was involved. The other half could not get chance to participate in this session, time constraint is one of the challenges of using the jigsaw technique; as performing jigsaw activities in a class can be time-consuming, proper

time management is absolutely necessary methodology which will drive students to learn a particular topic.

In their study, Moskowitz et al showed that the effect of Jigsaw method was less than that of other interactive teaching methods used in the chemistry course.¹⁵ It should be noted that the ineffectiveness of this method may pertain to the teachers' unfamiliar with it as well as lack of competency of teachers in the application of modern teaching methods (such as Jigsaw). Therefore in-service training programs are suggested for teachers that they must participate and become familiar with its benefits in learning and its effects on the success of students.¹⁶

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CONCLUSION

Today active teaching methods are emphasized in new curriculums in which students play the main role in learning. Jigsaw is one of the most important teaching methods. It improves teamwork and interpersonal communication, thinking, and problem-solving skills. In addition, it can promote learning among postgraduate and undergraduate students.

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Figure 1: HOME GROUPS AND EXPERT GROUP FORMATION IN JIGSAW

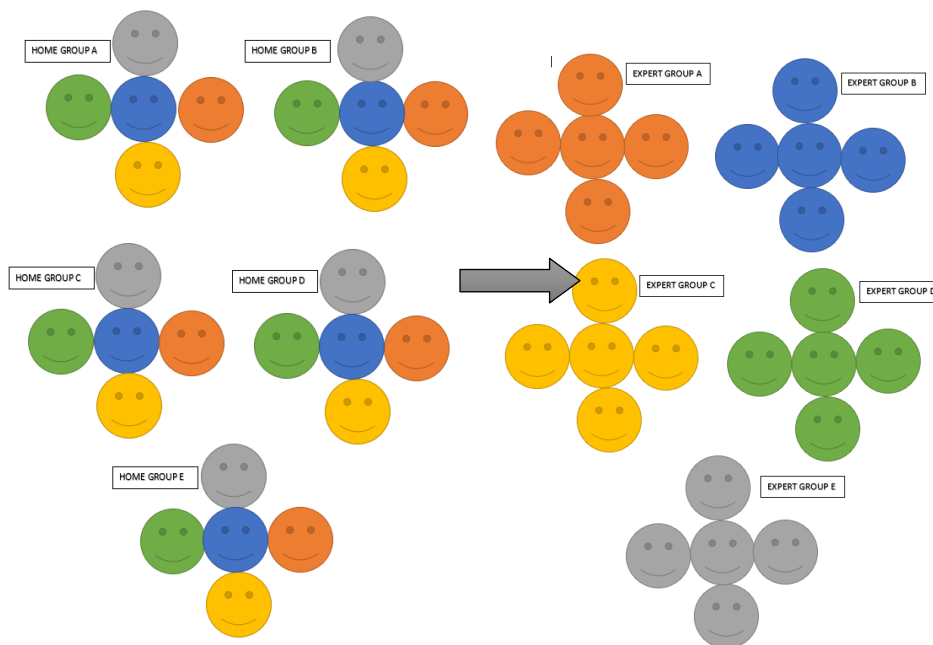


Figure 2: PRE AND POST TEST SCORES ANALYSIS

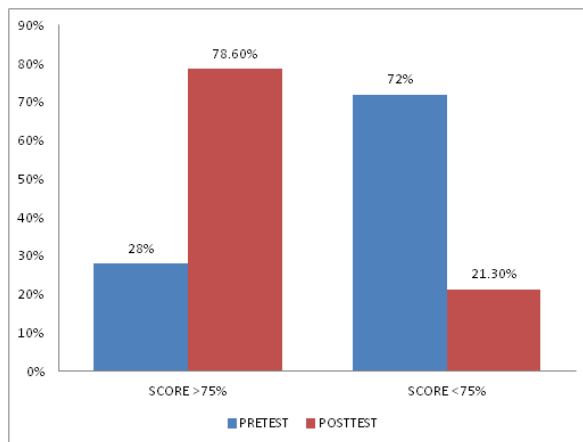


Figure 3: STUDENTS FEEDBACK ABOUT JT

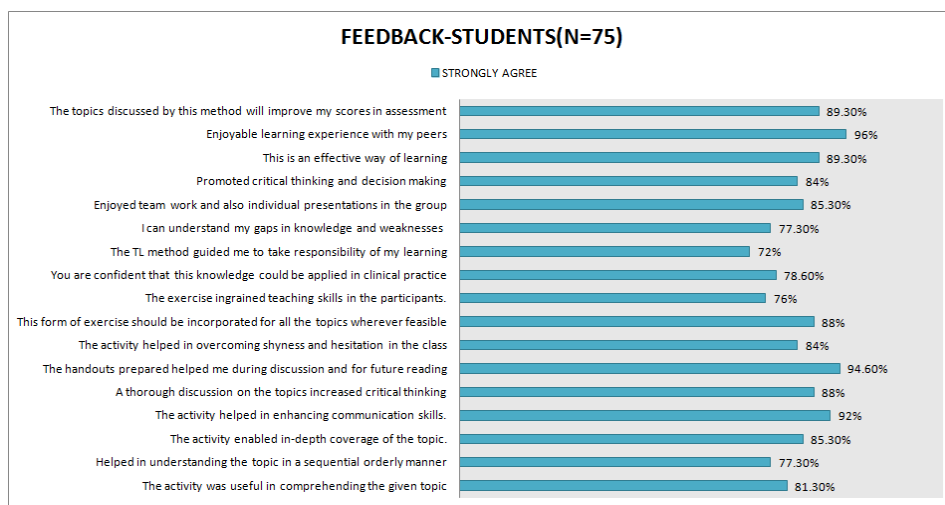


Figure 4: FACULTY FEEDBACK ABOUT JT

