Original Research Article

Jigsaw Method of Interactive Teaching to Unpuzzle Neuroanatomy


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ABSTRACT

Introduction: Student driven interactive methods of teaching are a major part of andragogy, which drives them to professional competency. Jigsaw method is one such interactive teaching modality which fosters self-directed learning and peer interaction. The aim of this study is to access the effectiveness of Jigsaw method of interactive teaching qualitatively and quantitatively among 1st year MBBS students.

Materials and methods: this study was done in 1st year medical students. The students were exposed to jigsaw method of interactive teaching in small groups and the program was evaluated by assessing the short and long term memory of the students. Feedback also was obtained from the students.

Results: There was a statistically significant difference in the mean scores as compared to traditional teaching methods. The perception of students also showed promising results.

Discussion: there have been many studies on student perception on such interactive teaching methods which revealed that the students were showing better academic performances. A few studies like the present one, on quantitative assessment of students score after Jigsaw method of interactive teaching has also shown good results.

Conclusion: the jigsaw method of interactive teaching encourages student participation and enhances self directed learning and peer assisted learning.

KEY WORDS: Neuroanatomy, jigsaw, peer learning, androgogy.

INTRODUCTION

Student driven interactive methods of teaching are a major part of andragogy, which drives them to professional competency [1]. Jigsaw method is one such interactive teaching modality which fosters self directed learning and peer interaction. Teaching is the best method of learning, hence peer teaching enhances learning [2]. The jigsaw method has been employed since the seventees and has proven to be effective in high school and a few recent studies prove its role in medical...
education as well [3,4,5]. The strategy of this method is assisted learning from multiple sources followed by peer discussion and teaching, facilitated by a subject expert. The aim of the study is evaluating qualitatively and quantitatively the effectiveness of the Jigsaw method of interactive teaching in learning neuroanatomy, which the students usually find it difficult to understand.

MATERIALS AND METHODS

This study was conducted among 1st year MBBS students of a private medical college in Chennai, India. Due ethical clearance was obtained from Institutional ethical committee.

Flow chart 1: Methodology of the study.

Step 1: Sensitisation of the faculty handling interactive teaching about the jigsaw method of teaching and the evaluation process.

Step 2: Medulla oblongata was the topic chosen for the study. Lecture on medulla oblongata by large group teaching (GT+ GJ)(N:245)

Step 3: Pre test using problem based MCQ - (GT+ GJ)(n245)

Step 4: The group GJ is sensitised about the jigsaw method of interactive teaching. (n=123)

Step 5: Previous day of session: The GJ students were divided into batches of 25 each and allotted a faculty. Each batch is divided into 5 groups with 5 members each (GROUP: A,B,C,D,E). Study materials were circulated as PPT, demonstration videos and clinical videos. The 5 subtopics were assigned, one each, to the 5 members in the group (A1,A2,A3,A4,A5, B1,B2 etc). The GT group was not provided the study materials.

Step 6: On the day of the session (Neuroanatomy of medulla oblongata): the GT group was taught using the traditional method of SGT. Jigsaw method was implemented in the GJ group. After which there was a presentation from each group on one subtopic. This was followed by a post test using problem based MCQ for both groups (GT+ GJ).

Step 7: After one and a half month a problem based written assessment was conducted on both groups, on the same topic (GT+GJ) to test for long term retention. Feedback is collected from the students.

Step 8: Crossing over was done with another topic so that both groups are benefitted

Step 9 The results were statistically analysed
The mean of the pretest of both the methods was found to be 5.5/10, the mean score of post test after traditional method was 7.32/10. The mean score of post test after the jigsaw method was found to be 8.5/10. The independent sample t test was applied in these two groups and p value (0.0000) was found to be statistically significant at 95% Confidence Interval. (Table 1, Graph: 1)

The mean of the scores for long-term retention assessment after traditional method was 7.29/10. The mean score for long-term retention assessment was jigsaw method was 7.86/10. The independent sample t test was applied in these two groups and p value (0.0000) was found to be statistically significant at 95% Confidence Interval. (Table 1, Graph: 1)

The results of qualitative assessment in the form of feedback also showed positive responses from the students. 49% of the group strongly agreed that jigsaw methods helped in long term retention. 49% strongly agreed that they would like to have such sessions in future. 47.1% of students opined that jigsaw method motivates them to learn better. 45% of students opined that this method improves peer interaction. 47.1% strongly agreed that jigsaw method of teaching was interesting. (Graph 2)
Table 1: Comparison of the scores of pre-test, post-test and long term retention in GT and GJ groups.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post Test Scores (Novel and Traditional)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Jigsaw method</td>
<td>8.5</td>
<td>1.4</td>
<td>0.000*</td>
</tr>
<tr>
<td></td>
<td>Traditional method</td>
<td>7.32</td>
<td>1.35</td>
<td></td>
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<tr>
<td></td>
<td>Long Term Retention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Jigsaw method</td>
<td>7.86</td>
<td>1.04</td>
<td>0.000*</td>
</tr>
<tr>
<td></td>
<td>Traditional method of SGT</td>
<td>7.29</td>
<td>1.38</td>
<td></td>
</tr>
</tbody>
</table>

* Statistically significant at 95% Confidence Interval

DISCUSSION

Many research studies on the Jigsaw method that was done in diverse fields. In one such study done amongst students of general chemistry at Ataturk University, it was seen that this method was effective with a P value of 0.001 [6]. In another study on Jigsaw method done on 200 students of Midwestern University Chicago College of Pharmacy, this method proved to be very effective and the author opined that this method may be useful in teaching concepts where integration of different types of material is required, and also in situations where the perspective of the student may affect the interpretation and application [7]. A study on Jigsaw method of interactive teaching was done in 2016 amongst Nursing students of University of Barcelona,
Spain, the results of which was quite deviant from the present study. They reported that attitude analysis gave a positive result but qualitative analysis gave a negative result [8].

In 2017 a research was done in All India Institute of Medical Sciences, Jodhpur, which concluded that, by using this method the satisfaction scores was greater than 80 in feedback on comprehension, communication skills, peer interaction, in depth analytical skills etc. [5]. A study conducted in the nursing students, University of Medical Sciences, Mashhad, Iran concluded that Jigsaw method is one of the most important teaching methods which promote learning among postgraduate and undergraduate students. In addition, it also helps in improving teamwork, thinking, problem-solving skills and interpersonal communication [4,9]. Jigsaw methods has been used in many other fields like engineering, primary school, language teaching and other science fields and proved to be of great significance [10,11,12,13].

**CONCLUSION**

Interactive teaching by jigsaw method is found to be very useful in enhancing the knowledge and in long term retention in Anatomy, as compared to the traditional method of small group teaching. It makes learning simpler, wider, interesting and improves peer learning. Further the stakeholders and the medical council can recommend such methods of interactive learning as a routine part of curriculum after further research.

**Conflicts of Interests:** None

**Author Contributions**

Rahe Rajan - conceptualization of the idea & manuscript writing

M.R.Renuka & W.M.S. Johnson - conceptualization of the idea & manuscript writing

Jinu Merlin Koshy -

Data collection and statical analysis

Krishnaveni Sharath -

Critical analysis, data collection

Durga Devi G - data collection

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