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Comparison of Mind Mapping (MM) and lecture based method - A Randomised Controlled Trial in teaching dental undergraduates

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Abstract

Aim: To compare the two-educational methods, Mind Mapping and lecture-based method in teaching dental undergraduate students.

Objective/s: The present study was conducted with the objectives to compare mind mapping and lecture based educational methods in teaching.

The dental undergraduates by assessing students' knowledge, to assess the effectiveness of mind mapping in learning.

The subject by assessing students' skill and to assess the student's perception about mind mapping in learning the subject.

Material and Methods: An intervention study was conducted among final year students in the Department of Public Health Dentistry at the Oxford Dental College and Hospital, Bengaluru. By simple random method (lottery method) participants were divided into two groups i.e., Lecture Based Group (LBG) and Mind Mapping Group (MMG) [Figure 1].

The students in LBG were taught the topics by conventional lecture class whereas students in MMG were taught with the help of a mind map using key concepts that were introduced to them and the assistance of a facilitator

(Figure 2 shows one of the mind maps drawn by a student with the help of the facilitator).

At the end of each session the students were assessed using validated questionnaire and the results will then be compared.

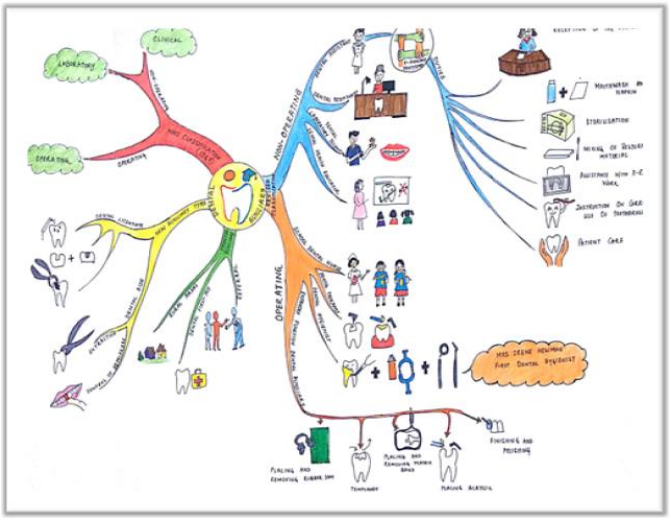

Figure: 1

Results: The mean age was 21±0.7 years out of which 30% males and 70% females**.** The mean knowledge score of Mind Mapping group and Lecture Based Group was 10.87±0.28 and 9.09 ±1.31respectively which was found to be statistically significant (p=0.00) Whereas the mean skill scores in the MM group and LB group was 7.25 and 3.33 respectively and it was also found to be statistically significant (p=0.001).MM method was found to be more effective and the students of MMG performed better skill wise.

Conclusion: MM is a multisensory tool that uses visuospatial orientation to integrate information, and has many potential applications to clinical education, and can be adapted to many situations. Mind mapping can be used in many situations including problem-based learning, small-group teaching, in a one-to-one context, as an examination tool and for personal revision. Using mind maps allows students to become more actively involved in their learning process.

Keywords: Randomised controlled trial, mnemonics, Mind-mapping, teaching, dental undergraduates, learning.

Introduction

The regular studies and obtaining vast information in any field is an integral part of any student's life. But one of the major problem a student will face during his course is organizing and retrieving the obtained information especially when it matters the most. Most students use many learning strategies like mnemonics, charts, maps. Some students might even use some self-developed innovative tools to make themselves convenient.[1] In recent years numerous papers have been published regarding use of web-based learning, e learning, problem-based learning, evidence-based learning, and case-based learning/teaching etc. These innovative strategies help students learn and ultimately integrate information.[2]Mind maps are active learning approaches that involve the learner in the learning process and permit the learner to integrate information actively on a metacognitive level. [3]

The mind mapping strategy was introduced to present generation by Tony Peter Buzan from Middlesex a well-known educational consultant an avid promoter of mind mapping and by Dr Allan Collins a cognitive scientist from America and researcher in semantic memory and cognition.[1] The inspiration for this strategy arose from the notebooks of Leonardo da Vinci.[4]

A mind map is a schematic representation of words, ideas, concepts or other items associated with a theme of study, being composed of topics organized into a hierarchy; i.e., there is a central topic from which others radiate.[5]

A key, central idea is placed in the centre of a page and is often surrounded by a memorable picture. Extending from the key central idea are several main branches, and from each of these main branches more detailed information is added (teaching) which mind mapping can be used as a teaching resource to facilitate the teaching experience.[6]

The use of images tagged to the branches is encouraged. The use of colour, especially for grouping and encoding

is also recommended. Although mind maps can be produced using paper and colour pens or pencils, several companies have developed mind-mapping software that facilitates drawing and allows saving of the maps. The original organic version of mind maps is ©I Mind Map. Mind Map is a registered trademark of the Buzan Organization Limited 1990.[7]

The ability to integrate information by finding valid relationships between concepts allows students who construct either mind maps or concept maps to reach a meta-cognitive level.[4] Both mind maps and concept maps allow students to recognize the intra- and inter-relationships betweenconcept.[8]

Materials and methods

An intervention study was conducted for a period of 3 months among final year undergraduate students in the Department of Public Health Dentistry at The Oxford Dental College, Bengaluru. By simple random method (lottery method) participants were divided into two groups i.e., Lecture Based Group (LBG) and Mind Mapping Group (MMG).

Students in the mind mapping group at the baseline was introduced to MM principles which included meaningful learning, mind map introduction and the instruction of constructing, assessing and scoring of mind maps. Following this, three more sessions were conducted to each of the two groups in which three topics were taught.

The students in LBG were taught the topics by conventional lecture class whereas students in MMG were asked to learn the topic taught by drawing a mind map of the topic taught, using key concepts that were introduced to them.

At the end of the session, the facilitator showed them mind map of the topic taught. At the end of each session the students were assessed using validated questionnaires and the results were compared (Figure1).

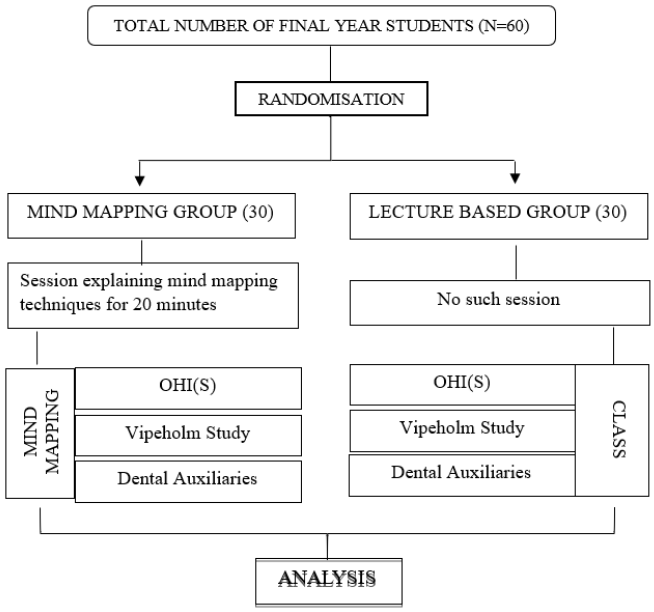

Figure: 2

Statistical methods

Statistical Analysis was done using SPSS.Quantitative data was evaluated using independent t tests in order to compare the two groups and p-value ≤0.05 was considered significant.

Results

A total of 60 final year undergraduate students were recruited and randomized into two groups of 30 each. The mean age was 21±0.7 years out of which 30% males and 70% females.

In session 1, the mean score of Mind Mapping group and Lecture Based Group was 10.9± 0.40 and 8.03±1.44 respectively. In session 2, the mean score of Mind Mapping group and Lecture Based Group was 9.96± 0.01 and 8.73±1.14 respectively. In the final session students of both Mind Mapping group as well as Lecture Based Group performed better with a mean score of 11.76± 0.43 and 10.53±1.35 respectively. There was statistically significant difference in the test scores between both the groups (Table 1)

The mean skill scores in the MM group and LB group was 7.25 and 3.33 respectively and it was found to be statistically significant (p=0.001*) [Table 2].

When student's perception about mind mapping as a learning tool was taken into consideration, 100% students agreed that mind mapping helped them to learn the topic and that it made learning interesting. Whereas 93% students agreed that mind mapping helped them to clarify inter relationship among curriculum and also agreed that it could be used as a learning strategy in other curricula. Further about 97% of the students perceived that mind mapping helped them to learn and think independently and that they could easily adapt to mind mapping.

About 80% students positively replied that mind mapping helped them in recalling information. Further an average number of students (72%) positively agreed that mind mapping helped them in organizing information and about usefulness of mind map as a new learning approach.

To conclude the knowledge and skill of the students in the mind mapping was found to be better than the lecture-based group. Also, the students' perception about mind mapping as a new learning approach was found to be positive (Figure 3).

Topics	Group	N	Mean	Standard deviation	Significant value (2-tailed)
OHI(S)	MMG	30	10.9	0.40	0.00*
	LBG	30	8.03	1.44	
Vipeholm Study	MMG	30	9.96	0.01	0.00*
	LBG	3	8.73	1.14	
		0			
Dental Auxilliaries	MMG	30	11.76	0.43	0.00*
	LBG	30	10.53	1.35	

p < 0.05*: Statistically significant ;
p < 0.001**: Statistically highly significant

Table:1

Mean Skill Sore	Group	Mean	Standard Deviation	Significant Value (2Tailed)
	MMG	7.25	2.188	0.001*
	LBG	3.33	1.803	

p < 0.05*: Statistically significant ;
p < 0.001**: Statistically highly significant

Table: 2

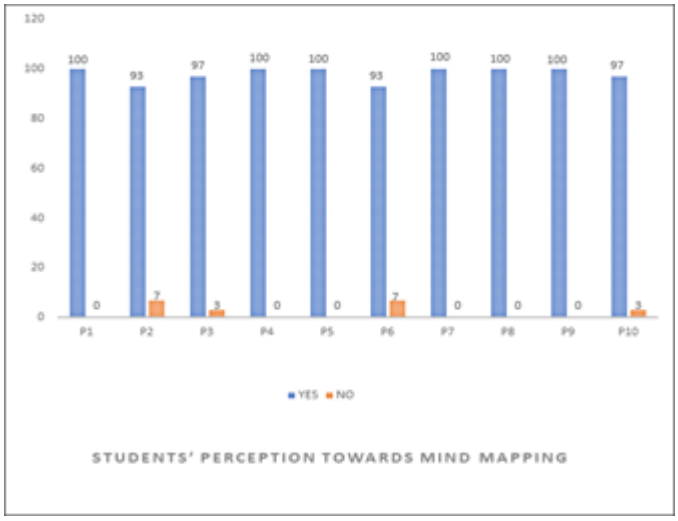

Figure:3

Discussion

Evaluation of the quality of education provided in dental schools requires assessment of existing curricula. Evaluating learning outcomes and retention of information is an integral part of education and directly affects the ability of the students. [9] The present study compared two educational methods that is Mind mapping and lecture-based method in teaching the final

year undergraduate students along with their perception about mind mapping in learning the subject.

The MM technique was found to be more effective than LB method. The mean score of Mind Mapping group and Lecture Based Group was 10.87±0.28 and 9.09 ±1.31respectively which was found to be statistically significant (p=0.00). The result of this study was found to be similar to the study by Eshwar S etal [4] where total score in the post test among the MM was higher than LBL group (15.57+6.51 vs 8.41+2.62, p=0.001).

The findings of the present study are also similar to the study conducted by Saeidifard et al[10] and by WikramaSinghe et al [11] where they found that Concept mapping method was more successful than lecture-based method and Mind map technique was perceived as a useful learning tool respectively. Further the present study was concurrent with the study done by Kalyan Sundaram M et al [8] where the mean knowledge score on Day 7, in mind map group was significantly more than the text group (8.9 Vs 8.5; p= 0.03).

However, the results of the current study were in contrast to the study done by Anthony V D' etal [1] where there were no significant differences in mean scores on both the pre- and post-quizzes between notetaking groups and no significant differences were found between pre- and post-HSRT mean total scores and sub scores.

When student's perception about mind mapping as a learning tool was taken into consideration, 100% students agreed that mind mapping helped them to learn the topic and that it made learning interesting which is comparable to the study done by Deshatty DD et al[7]where an overall of 86% students perceived that mind mapping was valuable for learning concepts.

Around 93% students agreed that mind mapping helped them to clarify inter relationship among curriculum and also agreed that it could be used as a learning strategy in other curricula which was similar to the study done by Choo SS et al [12]

where 90% students opined that mind-mapping helped them identify and rectify their misconceptions as well as re-enforced their understanding.

About 97% of the students perceived that mind mapping helped them to learn and think independently and that they could easily adapt to mind mapping and around 80% students positively replied that mind mapping helped them in recalling information which was similar to the findings by Choo SS et al [12] where the dental students' acceptance of the revision using mind mapping technique was reflected by the high overall mean of 4.0±0.4.

Further an average number of students (72%) positively agreed that mind mapping helped them in organizing information and about usefulness of mind map as a new learning approach. This finding is convergent with the study done by Chei-Chang Chiou et al [13] which indicated that concept mapping can help them to understand, integrate and clarify concepts and also enhanced their interests in learning.

Additionally, in the study done by Deshatty DD et al [7]majorities of students of MM group were of the opinion that minds map was a better learning tool in gross Anatomy which supports the finding of the present study.

Conclusion

The results of this study demonstrate that the students of mind map grouped performed better and that integration of mind mapping in the curriculum may be effective in promoting student's deep learning. The present study also indicates that mind mapping helped students to improve their learning achievement and interests and that adopting a mind mapping strategy can significantly

improve students' learning achievement compared to using a traditional teaching method.

Reference

1. D'Antoni AV, Zipp GP, Olson VG. Does the mind map learning strategy facilitate information retrieval and critical thinking in medical students? BMC Med Educ 2010; 10(61):1-11.

2. Spoorthi BR, Prashanthi C, Pandurangapp R. Mind Mapping: an effective learning adjunct to acquire tsunami of information. Int J Sci Res Pub 2013; 3(12):1-4.

3. D'Antoni AV, Zipp GP, Olson VG. Interrater reliability of the mind map assessment rubric in a cohort of medical students. BMC Med E Duc 2009;9(19):1-8.

4. Eshwar S, Jain V, Rekha K, Manvi S. Comparison of Mind Mapping and lecture-based teaching learning method among dental undergraduates using Solo Taxonomy in Bangalore, India. J Dent Sci 2016; 4(3):169-77.

5. Iniguez A.Mind Mapping for Dentists**.** Int J Oral Health Dent Man 2015;143(12):1-4.

6. Edwards S, Cooper N. Mind mapping as a teaching resource. The Clinical Teacher 2010; 7:236–9.

7. Deshatty DD, Mokashi V.Mind maps as a learning tool in Anatomy. Int J Annat Res 2013;1(2):100-03.

8. Kalyan Sundaram M, Abraham SB, Ramachandran D, Jayaseelan V, Bazroy J, Singh Z, et al. Effectiveness of mind mapping technique in information retrieval among medical college students in Puducherry-A Pilot Study. Indian J Community Med 2017;42(1):19-23.

9. Vilela VV, et al. The use of mind maps as support in medical education. J Contemp Med Edu. 2013;1(4): 199-206.

10. Saeidifard F, et al. Concept mapping as a method to teach an evidence-based educated medical topic: a comparative study in medical students. J Diabetes Metab Discord. 2014;13(1):86.

11. Wikrama Singhe A, et al. Effectiveness of mind maps as a learning tool for medical students. South East Asian J Med Educ. 2007; 1:30-32.

12. Choo SS, Mona M Abdalla, Mohdy M. Level of acceptance and effectiveness of mind-mapping as a tool for revision of the Immunity topic among dental students.

13. Chiou CC. The effect of concept mapping on students' learning achievements and interests.Innovation's in Education and Teaching International. Vol. 45, No. 4, November 2008, 375–387.