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MIND MAPPING- A LEARNING STRATEGY!! AMONG DENTAL STUDENTS: A COMPARATIVE STUDY

Dental Science

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ABSTRACT

Aim: To evaluate the effectiveness and retention of knowledge of two educational methods such as Mind Mapping and conventional teaching method among dental undergraduates.

Materials and Methods: This cross sectional comparative interventional study was carried out among final year dental undergraduates (n=80) at Rajarajeshwari Dental College & Hospital, Bangalore. Students were divided into two groups, Group A: Mind Mapping Group/ test group (40) and Group B: control group (40). A pretested questionnaire of 10 questions was used to asesess the knowledge at baseline, immediately after and a week after the intervention. Knowledge gain was the primary outcome variable and retention of the knowledge after a week is the secondary outcome.

Results: At the baseline the mean knowledge score was equal in both the group. Immediately after intervention, the mean knowledge score in the control group increased to 8.8, whereas in the mind map group, it increased to 9.4 and the difference was found to be statistically significant ($p = 0.003$). One week after intervention, the mean score in the mind map group was significantly more than the text group (9.3 Vs 8.6; $p = 0.003$).

Conclusion: The results of the study showed that mind mapping method was more effective as a teaching and learning method than the lecture based method

KEYWORDS

Mind Mapping, conventional teaching, Dental students, knowledge

INTRODUCTION

The main goal in our education system is to develop students' skills in order to reach information rather than transferring the present information[1].Tony Buzan introduced mind mapping technique to the world which paved way for people who have been employing the same in different areas since its development[2,3].

Mind mapping is a visual technique where information and knowledge are converted into a hierarchical diagram, formatted and illustrated, with structural key terms associated with a theme, helping learners to understand certain content better, integrate it and memorize it faster[4]. Its construction is very simple. In a mind map the main theme of the study is inserted in the center, from which keywords connected by colored lines and images branch nonlinearly in a divergent pattern. These keywords correspond to subtopics that, in turn, may present smaller branches that present more detail about the subject included, in a progressive branching pattern[5].

Various studies in literature search compared lecture based learning method with different approaches of learning (CBL[6], PBL[7], EBL[8], E-learning[9]). In dentistry only few studies have compared lecture based learning with mind mapping[5]. Hence the present study was aimed to evaluate the effectiveness of two educational methods such as Mind Mapping and conventional teaching method among dental undergraduates.

Research question: Whether there is any difference between mind mapping and conventional teaching method in retention of knowledge among Dental undergraduate students.

MATERIALS AND METHOD

A cross sectional comparative interventional study was carried out among final year dental undergraduates at Rajarajeshwari Dental College & Hospital, Bangalore during November 2018. Ethical clearance was obtained from the Institutional Ethical committee. All the final year undergraduate student who present at the day of study were included in the study. Informed consent was obtained from all the study participants before the study.

Questionanire Validation

A pilot study was conducted among 10 students who were not included in the main study. Reliability was measured through test retest. Internal consistency measured through Cronbach's alpha (α) was found to be 0.76. Face validity and content validity was done. The questionnaire had ten Multiple Choice Questions from the selected topics designed by the researcher. Four options were given to each question. Each right response carried 1 point and wrong response carried 0 point.

The study was carried out during routine class of 1 hour. Students were divided into two groups by lottery method. Group A: Mind Mapping Group/ test group (40) and Group B: Control group (40). Each group was made to sit in separate teaching halls. A topic from the recommended textbook of Public Health Dentistry was selected for the teaching session for both the groups. Group A was explained about mind mapping, its principles and construction of mind map. Then from the chosen topic the students were taught about the application of mind mapping on selected topic. Lecture based method was used to administer the selected topic in group B followed by group discussion. Questionnaire was introduced to the students to know about the baseline knowledge regarding the topic before starting of the study and the same questionnaire was given after the induction of topic respectively.

The knowledge of the participants was assessed on before the intervention, immediately after intervention and at Day 7. Knowledge gain is the primary outcome and the retention of knowledge after 1 week is the secondary outcome.

STATISTICAL ANALYSIS

The data was entered and analyzed in SPSS version 16.0. Independent sample t test was used to compare mean knowledge score between interventions. ANOVA was used to compare the mean knowledge gain over the time interval i.e. baseline, after intervention and 1 week after intervention. Post-hoc Bonferroni test was applied to assess the statistical significance at specific time interval.

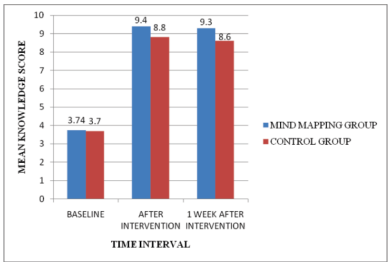
RESULTS

A total of 80 students were participated and were divided into two groups. The study sample comprised of around 41.25% males and 58.75% females. The mean age of the individuals was 20.97 ± 1.14 years. [Table 1].

Table 1: Demographic details of the participants

Characteristics	*Values N (%)*
Gender	
Males	33(41.25%)
Females	47(58.75%)
Total	80(100%)

Figure 1: COMPARISION OF THE MEAN SCORE BETWEEN THE GROUPS BEFORE INTERVENTION, AFTER INTERVENTION AND 1 WEEK AFTER INTERVENTION



It was shown that at the baseline the mean knowledge score was equal in both the group. The difference was statistically significant (p = 0.003). Immediately after intervention, the mean knowledge score in the control group increased to 8.8, whereas in the mind map group, it increased to 9.4 and the difference was found to be statistically significant (p = 0.003). One week after intervention, the retention of knowledge between the groups was statistically significant. (9.3 Vs 8.6; p = 0.003)(Figure 1)

TABLE 2: COMPARISION OF GROUP A AND GROUP B AT DIFFERENT TIME INTERVALS USING REPEATED MEASURES ANOVA

	F VALUE	*p value*
Group A	5.15	0.009*
Group B	0.92	0.39

*significant

The knowledge gained in mind mapping group over the period of time interval was statistically significant (F value= 5.15, p=0.009) as compared to control group(0.92, p=0.39). (Table 2)

Table 3: Post-hoc Bonferroni- Group A

Time interval	*Time intervals*	*Mean Difference*	*p value*
Before	After	-.120	.005*
	1 week	-.059	.346
After	1 week	.061	.419

The mean difference in knowledge gain was statistically significant (mean difference- -0.120, p-0.005) immediately after the intervention as compared to after a week. (Table 3)

DISCUSSION

Lecture based teaching method, which was used for several years, is doubtful to be efficient enough and memory retention by this method after 6 months is less than 5 percent. So it seems that an alternative method needs replacing[8].

Buzan mind mapping is a visual tool used to organize and relate themes or objectives. Buzan asserts that mind maps that incorporate pictures and different colors bring ideas to life[1]. A good mind map is able to show the overall structure of the topic or problem and lines and pictures. Unlike linear thinking techniques, mind mapping is a graphic technique that captures ideas and information[10]. Moreover, implementation of this technique which enhances the creativity, and makes learning and note-taking easier is extremely simple in which a hierarchical order is followed[1] .Students could integrate basic and clinical knowledge and move from linear thinking patterns to more integrated holistic patterns[8].

D'Antoni et al (2010) conducted a study to find out the relationship between mind mapping and critical thinking in Medical students. The study concluded that the mind mapping technique may be a valid and reliable tool that can be used among Medical students[11].

According to a study by Deshatty and Mokashi in 2013, MM was found to be an effective learning tool for medical students. In this study the pretest score of MM group (6.09 ± 2.04) was somewhat higher than the conventional group (5.29 ± 2.52)[12].

In present study the mean knowledge score at base line was almost same in both the group. This shows that the both groups had same knowledge regarding the topic before the intervention. After the intervention the mean score in both the group is increased but there was a statistically significant increase in mind mapping group compared to conventional group

The present study showed that mind mapping works better in comparison with conventional teaching method in retention of knowledge. Retention of knowledge was better in mind mapping group than in the conventional group, which is in line with study done by Farrad et al[13] among medical students, which acknowledges mind mappings superiority in knowledge retrieval. Thus shows mind mapping will serve as material for further revision of the subject, so that students can quickly reactivate their learning. It can also be used for study planning. Based on the mind map, students can assess their learning, topic by topic, and plan their dedicated effort based on the needs identified in the assessment[4].

The modern education have evolved greatly from blackboard oriented, teacher centered approach to the use of modern technologies. These methods involve one way process of knowledge transmission which leave students lagging behind in creative abilities. It is time to change the learning strategies that keep the students from empowering their critical thinking. Newer technologies that involve the students' participation are necessary nowadays. Mind mapping is one such method.

The use of mind Maps as a learning strategy can help students to master the tsunami of information presented in medical school[11]. It can be used in any situation that presents a structure of hierarchical relationships and their use develops the ability to organize and apply knowledge.

It also helps the intelligence, expanding the capacity to think systemically, allowing segmented attention and maintaining a relationship with the whole[4].

The goal of mind mapping techniques is to make it easier for students to represent or manipulate a complex set of relationships in a diagram, which in turn facilitates analysis, memorization and understanding these relationships. The ability to understand these relationships has been proposed as reflecting the kind of thinking needed for clinical practice[4].

The mind mapping can be taught easily. It does not require any instruments and is a cost effective method, hence hence it may be an attractive resource tool to add to the study strategy repertoire of entering medical students to help them learn and organize information. In dentistry only two studies have compared lecture based learning with mind mapping. There were not many studies available for comparison of the same. Only a small sample of students were available for this study, who may not be the representatives of Dental students in general. So further studies involving larger sample size should be carried out to find the importance of mind mapping in comparison to conventional method and longitudinal studies are to be conducted to ascertain the use of this method thereby making the health professionals curriculum more simple and reduce the burden of students.

Multiple mind-map sessions may be necessary for students to gain proficiency in the strategy before significant changes in the acquisition of domain-based knowledge and critical thinking emerge. Srinivasan et al suggested that concept map scores significantly increased in physicians who created concept maps on two separate occasions[14]

CONCLUSION

In this study we found that mind mapping as educational method was better than conventional teaching method in retention of knowledge. Mind mapping help students remember information, and retrieval of the same as they hold in a format that the mind finds easy to recall and

quick to review. It also helps to improve their innovative and critical thinking.

On the account of the aforesaid benefits, there is a need for teacher to know how to teach mind map technique and to associate the mind maps in their lessons.

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Nil.

CONFLICTS OF INTEREST
There are no conflicts of interest

REFERENCE

1) Tee TK, Azman MN, Mohamed S, Mohamad MM, Yunos JM, Yee MH, et al. Buzan mind mapping: An efficient technique for note-taking. Int J Soc Hum Sci Eng 2014;8:28-31.
2) Adodo, S. O. (2013). Effect of mind-mapping as a self-regulated learning strategy on students' achievement in Basic Science and Technology. Mediterranean Journal of Social Sciences, 4 (6), 163-172.
3) Evrekli, E., Iel, D. & Balim, A. (2010). Development of a scoring system to assess mind maps. Procedia Social and Behavioral Sciences, 2,2330-2334.
4) Vilela VV, et al. The use of mind maps as support in medical education. J Contemp Med Edu. 2013;1(4): 199-206.
5) 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 Res Rev J Dent Sci 2016;4:169-77
6) Ilgüy M, et al. Comparison of case-based and lecture-based learning in dental education using the SOLO taxonomy. J Dent Educ. 2014;78(11):1521-1527
7) Smits PB, et al. Problem-based learning versus lecture-based learning in postgraduate medical education. Scand J Work Environ Health. 2003;29(4):280-287.
8) 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 Disord. 2014;13(1):86.
9) Sadeghi R, et al. Comparison of the effect of lecture and blended teaching methods on students' learning and satisfaction. Journal of Advances in Medical Education & Professionalism. 2014;2(4):146-150.
10) Tucker, J. M., Armstrong, G. R. & Massad, V. J. (2010). Profilling a mind map user: a descriptive appraisal. Journal of Instructional Pedagogies, 2, 1-13.
11) D'Antoni AV, et al. Interrater reliability of the mind map assessment rubric in a cohort of medical students. BMC Med Educ. 2009;28(9):19.
12) Deshatty DD, Mokashi V. Mind maps as a learning tool in anatomy. Int J Anat Res 2013;1:100-3
13) Farrand P, Hussain F, Hennessy E. The efficacy of the 'mind map' study technique. Med Educ. 2002;36:426–431.
14) Srinivasan M, McElvany M, Shay JM, Shavelson RJ, West DC: Measuring knowledge structure: Reliability of concept mapping assessment in medical education. Acad Med 2008, 83:1196-1203