

The Influence of Mind Mapping Method in Dental Hygiene Education towards Knowledge of Primary School Students in Banda Aceh, Indonesia

Research Article

Ainun Mardiah^{1*}, Reza², Ratna Wilis³, Salikun⁴¹ Department of Dental Therapy and Hygiene, PoltekkesKemenkes Aceh, Banda Aceh 23231, Indonesia.² Department of Dental Therapy and Hygiene, PoltekkesKemenkes Aceh Banda Aceh 23231, Indonesia.³ Department of Dental Therapy and Hygiene, PoltekkesKemenkes Aceh, Banda Aceh 23231, Indonesia.⁴ Department of Dental Therapy and Hygiene, PoltekkesKemenkes Semarang, 50268, Indonesia.

Abstract

Background: One of the efforts to improve dental hygiene in children is to carry out educational activities. Mind mapping is among the types of an easy way for primary school students to understand the information through interesting pictures, symbols, or keywords that do not bore the students. The aim of study is to determine the influence of dental hygiene education with mind mapping method towards the knowledge of primary school students, specifically fourth-graders in Islamic Elementary School (MIN) of Masjid Raya Kota Banda Aceh, Indonesia.

Method: This type of research is a quasi-experiment with pre and post-test design with one group design. The study was conducted with 49 respondents. The data collection techniques was in the form of questionnaires about dental and oral hygiene knowledge. Having CI: 95% for a dependent T-test enabled us to do the data analysis.

Results: The comparison value has been found that after the implementation of the mind mapping method, 89.4% of the student's knowledge increased. Comparing to that of before using mind mapping, there was just 12.8%. The result has further strengthened our confidence that there is an increase in students' knowledge by mind mapping methods for dental hygiene education. Furthermore, the statistical test results obtained a p-value of 0.000 (<0.05) which confirms the presence of influence.

Conclusion: On combining the results, we conclude that there is an influence of the mind mapping method towards dental hygiene knowledge of the students.

Keywords: Mind Mapping; Knowledge; Dental Hygiene; Students; Banda Aceh.

Introduction

Health education, in the sense of education in general, is any planned effort to influence people, either individual or the community, so that they do what health practitioners expect. This definition implies the input elements (target and educators of education), processes (planned efforts to influence people), and output (doing what is expected). The expected outcome of health promotion is health behavior, or behavior to maintain conducive health for the goal of health promotion [1, 2].

Previous dental and oral hygiene education efforts have been carried out using various methods of lectures such as tooth brushing learning [3-6] and audio-visual media [7-10]. These methods

are generally cannot take the attention of the children. They tend to like something interesting, attractive, and directly practiced so that it will be easy to remember and be accepted. Health education methods through schemes and pictures are often preferred so that they are more easily understand. Such a method is called mind mapping [11, 12].

Mind mapping is a creative and effective way of taking notes and will literally map our thoughts. Notes created form interrelated ideas, with the main topic in the middle and sub-topics and they will breakdown into branches. The benefits of drawing and text someone to record or issue an idea that is in the mind, then we have used the two hemispheres of the brain synergistically. Mind Mapping is the easiest way to put some information into the brain

*Corresponding Author:

Ainun Mardiah,
Department of Dental Therapy and Hygiene, PoltekkesKemenkes Aceh, Banda Aceh 23231, Indonesia.
E-mail: ainun_mardiah_66@yahoo.co.id

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and take information out of it. The uniqueness of mind mapping occurs because every human being including children has different radiance (mindset, imagination, understanding, creativity, process information) [13, 14].

Through mind mapping, it allows students to make connections, see patterns, access related memory that has been previously stored, and develop memory paths that already exist. This mind map activity involves hand movements to create maps, paths, and connections between concepts. The process of continuous hand movements to connect this concept can improve the work of the brain in students so that the ability to understand concepts in the subject matter can be obtained maximally. For students with kinesthetic learning styles, the more body movement in the learning process, the more information will be gained.

It is explained that the mapping concept consists of several parts. The first is preparation. The specific step in the research investigators outline the research goals, which could be first, obtaining a participant. The second step is generation in which in this step, there is a brainstorming group to collect information from the participant according to the questions proposed. The third is structuring. In the structuring step, the separation is done with sorting-and-rating sessions to gain a better understanding of how items are related to one another. The fourth, representation which is computerized analysis to summarize the data into concept maps. This step is divided into the participant-processing stage and the researcher-processing stage. The fifth is interpretation in which the participants are invited for sorting-and-rating sessions to address the goal of researchers exploring the participant. The last step is utilization. The researchers reconvene to discuss the findings upon the completion of data collection and analysis [15].

Based on the data from the Baiturrahman Community Health Center, 560 cases of caries were found in 15 elementary schools including Islamic Elementary School (MIN) Mesjid Raya in Banda Aceh City, Indonesia. The highest percentage of caries rates was MIN Mesjid Raya in Banda Aceh, as many as 50 caries cases out of 80 people. Based on the results of interviews with 15 students, 10 of whom have poor knowledge about dental and oral hygiene. Hence, the researchers are interested in examining the effect of the mind mapping method on school-age children's knowledge in terms of dental and oral health. The purpose of this study is to analyze the effect of mind mapping methods on dental and oral health knowledge of Grade IV in MIN Mesjid Raya Banda Aceh

City.

Materials and Methods

The type of this research is a quasi-experiment, in which students are given treatment in the form of a dental hygiene mind mapping method. We used a pre and post-test design with One Group Design, which the treatment will be done in one group. This research was conducted at MIN Mesjid Raya Banda Aceh City. The population in this study were all 4th-grade students with 47 students. The sampling technique was with a total sampling technique.

The scope of the research is dental hygiene knowledge including what is dental hygiene, dental and oral disease, and how to take care of our teeth by using mind-mapping methods so that it can determine its effect on dental and oral health knowledge of fourth-grade students at MIN Mesjid Raya Banda Aceh City.

The research was analyzed using the univariate and bivariate technique. Univariate analysis is intended to see an overview of the independent variables, namely education of mind mapping of dental and oral health both before and after each treatment shown by tabulation and description. On the other hand, bivariate analysis is done to understand the influence of the mind mapping method in dental and oral health by paired t-test.

Results

The respondents in this research were divided into several category, i.e. general data and specific data. General data consists of age and gender while the specific data consists of univariate with sub of knowledge level of the students before and after the treatment of mind mapping. Apart from univariate, there is variate analysis, which obtain the influence of mind mapping method. The following tables show the statistical number related to this research. Table 1 shows the highest number of respondents based on age is 10 years with 39 students (83.0%).

Table 2 shows the highest number of respondents by gender is male group with 29 students (61.7%), while the female students are only 18 people (38.3%).

Table 3 shows the level of student knowledge before the implementation of mind mapping method is 46.8% in the fair category, 40.1% of the level of knowledge is bad, while those included in

Table 1. Frequency Distribution of Respondent based on Age.

Age	N	Percentage (%)
10 years old	39	83.0
11 years old	8	17.0
Total	47	100

Table 2. Frequency Distribution of Respondent based on Gender.

Gender	N	Percentage (%)
Male	29	61.7
Female	18	38.3
Total	47	100

Table 3. Knowledge Level before Implementation of Mind Mapping.

Knowledge	N	Percentage (%)
Good	6	12.8
Fair	22	46.8
Bad	19	40.4
Total	47	100

Table 4. Knowledge Level after implementation of Mind Mapping Method.

Knowledge	N	Percentage (%)
Good	42	89.4
Fair	3	6.4
Bad	2	4.2
Total	47	100

Table 5. Mind Mapping Influence towards Knowledge Level.

Variable	Mean	R calculation	P value
Pre-test	58.09	-11,339	0.000
Post-test	90.00		

the good category are only 12.8%.

Table 4 shows the level of knowledge after an educational mind mapping method was implemented. It increased to 89.4% for good category, fair level by 6.4% while those with bad knowledge level were only 4.2%.

The results of the study as presented in Table 5 noted that the knowledge of students after the mind mapping method is greater than before it was carried out. This showed an increase in the knowledge level of the students about oral health. Statistical test results obtained the value of $P = 0,000$ ($p < 0.05$) so that at CI: 95% H_0 is rejected and H_a is accepted. Therefore, it can be concluded that at the 95% significance level, there is an influence of students' knowledge before and after the mind mapping method of oral and dental hygiene.

Discussion

According to the research data has been obtained, the results of statistical tests was significant $p = 0,000$ (< 0.05) at a 95% confidence level. Thus, it can be concluded that there was a significant influence between students' knowledge before and after the mind mapping method about dental and oral hygiene at MIN Mesjid Raya Banda Aceh City.

The use of mind mapping methods with images and colors will make students more interested and remember material about oral health. Therefore, students' knowledge will be better after the mind mapping methods was applied. One way that can be used to improve knowledge and learning skills is by using the mind mapping method. Mind mapping was chosen because it is one of the effective and efficient learning methods in which there are aspects of learning skills encompasses taking notes and remembering. This is in line with the previous conducted research which stated that the mind map method is more effective than tradi-

tional methods [16]. Mind mapping can help students in learning and increase knowledge so that they will be more successful in learning. This is supported by the results of the previous research which concludes that there is an increase in student learning outcomes through the application of mind mapping type cooperative learning models [17]. Research that tested the mind mapping method with learning skills was conducted, it stated that the mind map technique with the mind mapping method was effective to increase students' knowledge [18]. Learning methods with mind mapping are very suitable to develop children's thinking abilities. Mind Mapping is the easiest way to put information into the brain [19]. Mind mapping is a creative, effective, and literally literate way to "map" our thoughts. Mind mapping is a good method used as a tool for health education that involves cognitive, effective and psychomotor components. By utilizing symbols, pictures and colors when a child brings out an idea that is in his mind, the child has used the two hemispheres of the brain synergistically [20]. Mind mapping will help the students to learn information since such a learning method gives them a force to organize and put images as well as color to it [21].

Mind mapping has many benefits. First, it is flexible. When the teacher or others explain the material, students easily add it in the appropriate place in their Mind mapping without confusion. Second, it makes the student stay focus and pay attention because Mind mapping does not make students capture every word explained from the teacher or others, rather simply capture the main ideas conveyed. Third, it helps to improve our understanding. Fourth, it is such a fun learning because Mind mapping combines unlimited creativity and imagination of students, this is more exciting when compared to taking regular notes [22]. This is in line with research conducted stated that there is a significant difference between the results of the pretest and posttest in the experimental group with $p = 0.020$ so that the mind mapping method can improve learning outcomes of integrated natural science subjects [23].

An experimental design of mapping was also used towards nursing students in which successfully support as a cognitive tool to enhance students' critical thinking (CT) in the way of encouraging them to explore the information. Besides, a paired t-test was also used to identify whether the method brings betterment. The betterment is brought as the paired t-test showed the significant improvement for the students according to the value of $P < 0.001$ [24].

The results of the research conducted also stated there was an influence of the application of the mind mapping experimental method to increasing knowledge [25, 26]. The results showed there was a significant influence in the application of mind mapping learning models to the learning outcomes of grade IV students of SDN 2 TanjungSenang. Mind map that was used as a treatment in this research was a form of learning strategy to understand the material by using notes as an external memory aid. Human memory is easier to store information in the form of images with long periods of time. The results of creating mind maps therefore can be used as external learning aids so that they can be reviewed easily rather than reread as a whole. Making notes can function as a memory aid that is external [27]. Mind mapping is effective to improve the results of Junior High School student knowledge because there are advantages of using mind mapping in class. It allows students to focus on the subject, give a clear picture as a whole in one paper, and provide details as well as group the concepts and compare them.

Conclusion

According to the results, the level of knowledge of students before the mind mapping method was 46.8% in the fair category, and 40.1% had poor level of knowledge, while those in the good category were only 12.8%. After the educational mind mapping method was applied, the level of knowledge of students showed an increase as much as 89.4% in good category, 6.4% in fair category, while those with less knowledge were only 4.2%.

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