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# Effectivity of Dental Health Education on Knowledge and Plaque Score of Junior High School Students

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***Abstract:*** *World Health Organization (WHO) recommend the school children as an appropriate group to promote dental health education in order to maintain their oral hygiene.The aim of this study was to evaluate the effectivity of dental health education on knowledge and plaque score of junior high school students in Medan City.This study was an experimental study with pre and post test group design. Population was all students of SMP Negeri 1 Medan. The sample were 208 students taken purposively from I and II grade which inclusion criteria are cooperative and not using fixed orthodontic appliance. Knowledge score was measured using questionnaire and plaque score was measured using Löe and Sillness Plaque index. Knowledge and plaque score were measured before, after and a week after dental health education. Data were analyzed by using ANOVA. The result shows that students who have knowledge before dental health education was only 4.8% in good category, meanwhile after dental health education the good category was increased into 96.2%, even though after a week there is 93.3% still in good category. There was a significant differences of knowledge before the score was 52.26± 11.87 , after 95.26± 8.91 and a week after dental health education it became 94.27± 9.38 ($p<0.05$). The plaque score before dental health education in good category was 51.9%, after dental health education was increased into 96.2% and a week after dental health education was 89.9%. There was significant differences of plaque score before 0.98± 0.44, after 0.40± 0.29 and a week after dental health education 0.43± 0.37 ($p<0.05$). In conclusion,dental health education in junior high school students is effective in improving student's knowledge and decreasing plaque score.*

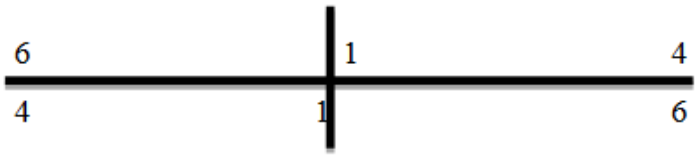
***Keywords:*** *dental health education, knowledge, plaque score*

## I. Introduction

Oral health among the Indonesian communities is still an issue that needs serious attention from medical personnel, both dentists and dental nurses, as dental and oral diseases are suffered by 90% of Indonesia's population (Anita &Rahayu 2005). Data from Riskesdas (2007), have listed ten groups of common diseases, and shown that dental and oral diseases are the first most complained disease by people in Indonesia. The prevalence of people who have dental issues for the last 12 months is 23.4%. During growing and developing phase, teenagers often have health problems, one of them are oral hygiene problems. World Health Organization (WHO) recommends that school students are the right group to take health promotion efforts in maintaining oral health and the surrounding tissues. Dental and oral hygiene and gingival problems often occurs in adolescents aged 12-15 years old (Lesar 2015). Research by Carneiro and partners about oral health in junior secondary students in Tanzania showed that 84% had sufficient knowledge about oral health but have a low level in habits. Lian and partners conducted a study among secondary students in Kuching, Sarawak, showed that only 53.4% of students who have high awareness on oral health. Humagain conducted a research to evaluate the knowledge, attitudes and behavior about oral health among junior high school students in rural areas of Nepal. The results showed that only 20% reported having regular dental and oral check-up. In the study conducted by the Children's Section of Dentistry, University of Padjadjaran in 2004 for 6 months showed that the tooth brushing program at school will affect the improvement of oral hygiene in students (Sari 2012). Knowledge is very important as it contributes to a person's actions. Therefore, based on the experiences and research for behavior development based on knowledge will be more durable than the behavior that is not. Knowledge in students are very important in the formation of the underlying behaviors on whether it supports or not the oral hygiene. Such knowledge can be obtained naturally or in a planned manner which is through the educational process. Knowledge about dental care should be given from an early age, because children at an early age will comply to understand the importance of health as well as restrictions that must be shunned or habits that may affect the condition of the teeth. Oral health education should be given to school-age children (Ignatia 2013). The purpose of this study is to determine the effectiveness of oral and dental health education on the knowledge and plaque score in students of SMP Negeri 1 Medan by calculating the difference in knowledge score and plaque score before, after and the week after education. The results of this study are expected to provide information on the levels of knowledge and plaque score after junior high school students is counseled with dental health education and given training on how to brush teeth correctly.

## II. Methods

This study is an experimental study with pre and post test group design. The population consisted of all students of SMP Negeri 1 Medan while the samples taken were grade I and II which was 208 students aged 13-14 years drawn purposively who met the inclusion criteria were students that are not wearing orthodontic appliances and very cooperative. Dental and oral health education was presented in the form of power point presentations and video as well as demonstration and training on how to brush teeth correctly. Knowledge was measured by using questionnaires containing questions about the purpose, frequency and timing of brushing, brushing correctly, the type of toothbrush used, time of brushing, tooth brushing tools, and toothpaste used. Plaque score was measured using Loe and Sillness plaque index which is total score obtained on plaque examinationon teeth that have fully erupted. Number of teeth examined were 6 teeth specifically, certain measurements performed on the four surfaces which is mesial, distal, buccal, lingual / palatal. If one of the 6 tooth that needed to be checked is missing, therefore the adjacent tooth is checked.




Plaque examination is given the score according to following scores and criteria :

| Scores | Criteria |
|---|---|
| 0 | No plaque |
| 1 | A film of plaque adhering to the free gingival margin and adjacent area of the tooth. The plaque may be seen only after application of disclosing solution or by using the probe on the tooth surface. |
| 2 | Moderate accumulation of soft deposit s within the gingival pocket, or the tooth and gingival margin which can be seen with the naked eye. |
| 3 | Abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin, it can be seen from a distant away. |

$$\text{Plaque scores (one tooth)} = \frac{\text{Total scores form each of the four surfaces}}{4}$$

$$\text{Plaque scores (whole teeth)} = \frac{\text{Total scores}}{\textit{Number of the examined teeth}}$$

The evaluation criteria for the Loe- Silness plaque index are:
a) Good category: score 0 - 0.9
b) Moderate category: score 1 - 1.9
c) Bad category: score 2-3

**Procedures**

1. Subjects that were selected were given an explanation about procedures that would be conducted, and later they were given questionnaires about their knowledge on oral health.
2. Before measuring plaque scores, a drop of disclosing solution were applied on the tongue of the subjects and instructed to smear it to the entire surface of the tooth. Examination of plaque score performed by using a sonde and mouth mirror using Loe and Silness Plaque Index (measurement I).
3. The results were recorded on the examination sheet.
4. Subsequently, the subjects were given counseling on dental health as well as the demonstration on correct way of brushing teeth, and then tooth brushing together.
5. Giving questionnaires again and measurement of plaque score was measured after counseling and tooth brushing together (measurement II).
6. After one week, the researchers gave a questionnaire about knowledge and checked the score of the plaque checked (measurement III).
7. The examination sheet that had been filled in subsequently collected to be processed and analyzed.

Data collected were analyzed by using a computerized system. Analysis of the data to calculate the difference in knowledge score and plaque score before, after and the week after oral health education by using repeated measure ANOVA test.

## III. Results And Discussion

The percentage of female respondents is 52.4% more than male 47.6%. 88.9% of respondents mostly aged 13 years and only 11.1% of those aged 14 years (Table 1).

**TABLE 1.** The Characteristics Of The Respondent Students Of Smp Negeri 1 Medan (N = 208)

| Characteristics | | n | % |
|---|---|---|---|
| **Gender** | **Male** | 99 | 47,6 |
| | **Female** | 109 | 52,4 |
| **Age (Years Old)** | **13** | 185 | 88,9 |
| | **14** | 23 | 11,1 |

The results show that the level of knowledge before counseling mostly at bad category which is 48.6%, at good category after education shown 96.2% which is the highest and a week after education good category is categorized as the highest which is 93.3%. These results collaborates with research by Isofah and Nonik which shows that there is an increase in knowledge after education using lectures, demonstrations and question and answer. The results also supported by Oki and partners' study which shows that there is an increased level of knowledge after education with the media power point (Claudiette 2014). However, the average knowledge of responder a week after education decreased compared to after education but still in good category. This may be due to incomplete process from the stages of behavioral adoption (Table 2).

**TABLE 2.** The Level Of Knowledge Before, After And The Week After Education To Students Of Smp Negeri 1 Medan (N = 208)

| Knowledge Level | Before | | After | | After a week | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| **Good** | 10 | 4,8 | 200 | 96,2 | 194 | 93,3 |
| **Moderate** | 97 | 46,6 | 6 | 2,9 | 14 | 6,7 |
| **Less** | 101 | 48,6 | 2 | 1,0 | 0 | 0 |

Statistical analysis shows there is a significant difference between prior knowledge score (52.26 ± 11.87), after (95.26 ± 8.91) and a week after the counselling (94.27 ± 9.38) (p <0, 05). Results of research conducted by Luluq and Ery show that health education with video media has better influence on increasing the knowledge and attitudes of respondents. Video has better approach because it has a media type of motion that is audio and visual media that can display the picture and sound more interestingly so respondents are expected to be more motivated to listen (Edayati 2014). (Table 3)

**TABLE 3.** The Average Score Of Knowledge Before, After And The Week After Education (N = 208)

| Sample group | Knowledge Score x ± SD | Statistical Analysis |
|---|---|---|
| **Before DHE** | 52,26± 11,87 | |
| **After DHE** | 95,26± 8,91 | |
| **A week after DHE** | 94,27± 9,38 | $p < 0,05$ |

Plaque score at good category before educationis the highest which is 51.9%, after educationthe highest is good category which is 96.2% and the highest in a week after education is good category which is 89.9%. Based on research Ignatia and partners, they stated that the domain knowledge is very important for the formation of a person's actions, therefore, based on experience and research, the formation of behavior based on knowledge will be more longer than the behavior that is not. (Andlaw, 1992). (Table 4).

**TABLE 4.** Category Of Plaque Score Before, After And A Week After Education (N = 208)

| Plaque score category | Before | | After | | After a week | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| **Good** | 108 | 51,9 | 200 | 96,2 | 187 | 89,9 |
| **Moderate** | 91 | 43,8 | 8 | 3,8 | 20 | 9,6 |
| **Bad** | 9 | 4,3 | 0 | 0 | 1 | 0,5 |

Statistical analysis shows significant difference between the scores of plaque before (0.98 ± 0.44), after (0.40 ± 0.29) and a week after the education (0.43 ± 0.37) (p <0, 05). In this study, education is done by using the lecture method with the aid of a powerpoint presentation and video media, demonstrations and question and answer. Merging these three methods is appropriate in order to achieve the objectives of the study where lectures are used to convey a message that is informative, demonstrations can simplify and deepen the process of receiving targeted towards extension materials that give a sense or understanding better while debriefing will provide an opportunity to the respondents to express opinions resulting in feedback from respondents (Isrofah 2010). In this research,, shown a significant reduction in plaque score after the dental and oral health education. (Table 5).

**TABLE 5.** The Average Plaque Score Before, After And The Week After Dental Health Education (N = 208)

| Samplegroup | Plaque score x ± SD | Statistical Analysis |
|---|---|---|
| **Before DHE** | 0,98± 0,44 | |
| **After DHE** | 0,40± 0,29 | |
| **A week after DHE** | 0,43± 0,37 | *p*< 0,05 |

## IV. Summary

There is a significant difference ($p$ = 0.000) on the level of knowledge and plaque score before, after, and the week after education, where there is an increase in knowledge and decrease in plaque score higher at after the education compared to a week after education. It can be concluded that dental and oral health education among junior high school students is effective on improving the knowledge and decreasing the plaque score.

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