

## DMF-T index of 12-15 years old children

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### ABSTRACT

**Introduction:** Dental caries was a disease which is often found at every social strata of Indonesian people at men or woman and children or adult. According to the Survey of Health Family in the year 2001, case numbers of dental caries in Indonesia was 76,2% at age group 12 years. This research is aim to identifying the DMF-T index of 12-15 years old children in 2nd Junior High School (SMP Negeri 2) PTPN VIII in Pangalengan.

**Methods:** The descriptive method was applied for data analysis. The structured interview technique was applied for collecting the data needed in this study. The respondents included in the study were 122 children aged 12-15 years, which consist of 41 boys and 81 girls. Sampling retrieval was using total sampling technique. **Results:** This research found that the DMF-T index of 12-15 years old children in 2nd Junior High School (SMP Negeri 2) PTPN VIII Pangalengan is 4,39.

**Conclusion:** The conclusion of this research is DMF-T index of 12-15 years old children in 2nd Junior High School (SMP Negeri 2) PTPN VIII Pangalengan falls into medium

Keywords: DMF-T index, 12-15 years old children

### INTRODUCTION

Dental caries is a disease that is often found in every social strata of Indonesian society both in men and women as well as children and adults. Caries is a disease of hard tooth tissue, ie enamel, dentine and cementum caused by the acid produced by bacterial activity in carbohydrate dispersal (Fejerskov and Kidd, 2003) .<sup>1</sup>

Caries is expressed as a multifactorial disease that is a number of factors that cause the formation of caries. Three main factors that play a role are host or host factors, microorganisms, substrate or diet and plus time factor, described as three overlapping circles. Caries occurs when the condition of each factor is mutually supportive, which is a susceptible host, a cognitive mi-

croorganism, a suitable substrate and a long time (Harris and Christen, 1995) .<sup>2</sup>

Dental health problems in Indonesia are still interesting to investigate. According to the Household Health Survey in 2001 the incidence of dental caries in Indonesia was 52.3% and 76.2% in the age group of 12 years.

According to data from Riskesdas (Basic Health Research) in 2007, the DMF-T index for West Java is 6.88 in general. Means the average tooth decay in the population of West Java 7 teeth per person. The largest component is the extracted tooth / M-T of 3.75. This means that the average population of West Java has 4 teeth that have been extracted or an indication of extraction, while the DMF-T index for children aged 12 years is 2.67. Whereas in order to achieve the target of

achieving dental health services in 2010, WHO has determined that 12-year-olds have the severity of tooth decay (DMF-T index) of only 1 (one) tooth (Risesdas West Java, 2007).<sup>4</sup>

According to WHO, 12-year-old group is a critical indicator, because about 76.97% of caries attack at that time. This age group is important for examination since most children leave primary school at 12 years of age. In addition, all permanent teeth are estimated to have erupted in this age group except the third molar. Based on this, age 12 is defined as a global monitoring age for caries, whereas the age group of 15 years is considered that permanent teeth have adapted to the oral environment for 3-9 years (Pintauli and Taizo, 2008).<sup>4</sup>

Research Wiworo Haryani et al in 2002 concluded that 30% of rural children say after eating tea or not drinking at all. Brushing time after eating is also rarely done so this situation strongly supports the occurrence of caries.<sup>5</sup>

SMP Negeri 2 Pangalengan located in PTPN VIII Perkebunan Malabar, Banjarsari Village, Pangalengan was chosen to do research on the basis of similarity of socio-economic background and the work of his parents as employees of PTPN VIII Pangalengan.

Based on the things mentioned above, the authors are interested to examine how the DMF-T index in children aged 12-15 years in SMP Negeri 2 PTPN VIII Pangalengan.

## METHODS

The type of research used is descriptive, in the implementation of this research using survey techniques. The population is children aged 12-15 years old in SMP Negeri 2 PTPN VIII Pangalengan with population criteria (1) Boys and girls, (2) Aged 12-15 years, (3) Public health good, (4) Child from employees of PTPN VIII Pangalengan, (5) Children are cooperative and willing to fill out informed consent sheets. The entire population that meets the criteria is then taken as a sample using total sampling technique. The measurement scale used in this study is the DMF-T index, which measures the number of permanent teeth affected by caries (Decay), has been revoked due to caries (Missing), or restored (Filling). The measurement formula is as follows (John, 2006):<sup>6</sup>

DMF-T Index

$$= \frac{\text{Total D + M + F}}{\text{Total numbers of samples examined}}$$

The DMF-T index category calculated by WHO is as follows (Pine, 1997):<sup>7</sup>

0 - 1,1	: Very low
1,2 - 2,6	: Low
2,7 - 4,4	: Moderate
4,5 - 6,5	: High
> 6,6	: Very high

Data obtained from the results of the study were collected and presented in table form by using univariate analysis technique, that is the analysis done on the variables from the research. This analysis only results in the distribution and percentage of variables. Percentages were obtained by using the formula (Sudjana, 2005):<sup>8</sup>

$$\times 100\%$$

Description:

P = Percentage

F = Frequency

N = Total samples for research

## RESULTS

DMF-T index is obtained through dental clinical examination in children aged 12-15 years in PTPN VIII Pangalengan. Then recorded in odontogram and calculated DMF-T Index. DMF-T index includes permanent teeth affected by caries (Decay), lost due to extractions (Missing), and has been restored (Filling).

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DMF-T Index

$$= \frac{\text{Total D + M + F}}{\text{Total numbers of samples examined}}$$

$$= \frac{536}{122} = 4,39$$

Table 1. shows the total number of caries affected by caries totaled 492, has been extracted amount- ed to 35, and the filled is 9. So the DMF-T Index obtained in children aged 12-15 years in SMP Neg-

Tabel 1. DMF-T Index in Children of the Age 12-15 at SMP Negeri 2 PTPN VIII Pangalengan

Category	f	%
D	492	91.79
M	35	6.53
F	9	1.68
DMFT	536	100

Table 2. Frequency of Decayed Permanent Teeth of Children Age 12-15 at SMP Negeri 2 PTPN VIII Pangalengan

Decay	f	%
<4	51	41.8
4-5	37	30.3
6-9	34	27.9
Toal	122	100.0

Table 3. Frequency of Missing Permanent Teeth of Children Age 12-15 at SMP Negeri 2 PTPN VIII Pangalengan

Missing	f	%
0	101	82.8
1	12	9.8
2	6	4.9
3	1	0.8
4	2	1.6
Total	122	100.0

Tabel 4. Frequency of Filled Permanent Teeth in Children of Age 12-15 at SMP Negeri 2 PTPN VIII Pangalengan

Filling	f	%
0	120	98.4
1	1	0.8
8	1	0.8
Total	122	100

Table 5 Frequency of Decay, Missing, and Filling According to Type of Tooth Affected

Gigi	Decay	%	Mising	%	Filling	%
I1	13	2.64	0	0.00	0	0
I2	9	1.83	0	0.00	0	0
C	8	1.63	0	0.00	0	0
P1	27	5.49	5	14.29	1	11.11
P2	29	5.89	6	17.14	1	11.11
M1	263	53.46	22	62.86	1	44.44
M2	143	29.07	2	5.71	3	33.33
Total	492	100	35	100	9	100

Table 6. Decay Frequency Based on Gender

Decay	f	%
Male	179	36.38
Female	313	63.62
Total	492	100

eri 2 PTPN VIII Pangalengan is 4.39. Based on the WHO criteria, the DMF-T index results in children aged 12-15 years in SMP Negeri 2 PTPN VIII Pangalengan included in the medium category.

Table 2. above shows that the total number of respondents is 122 people with the highest percentage of respondents who have decay category less than 4 that is 51 people (41.8%), respondents have decay category between 4 to 5 is 37 people (30.3%), while the rest that has decay categories between 6 to 9 is 34 people (27.9%).

Table 3. above shows that respondents with the highest percentage are respondents who do not have missing that is 101 people (82.8%), and respondent have missing 1 that is 12 people (9.8%), whereas that have missing most low is 3 and 4 that is each of 1 person (0.8%) and 2 person (1.6%).

Table 4. The above shows that the total of respondents is 122 people with the highest percentage are respondents who do not have filling that is 120 people (98.4%), and the respondents who have filling 1 and filling 8 are each - 1 person (0.8%). The frequency of caries (decay), lost due to extraction, and teeth that are restored (filling) based on the affected tooth type will be presented in the following table.

Table 5. above shows that the percentage of teeth most affected by caries (decay) is the first molar teeth that is equal to 53.46% or as many as 263 teeth. Followed by second most affected teeth caries (decay) is the second molar of 29.07% or as many as 143 teeth. The most missing teeth lost due to missing are also possessed by first molars with a percentage of 62.86% or 22 teeth. This figure exceeds half of the total missing. The most teeth with filling are the first molar with a percentage of 44.44% or 4 teeth of the total filling amount.

Decay frequency based on gender, ie men and women will be presented in the following table.

Table 6. above shows that respondents with Decay mostly are female respondents as many as 313 teeth (63.62%), while the rest are male respon-

dents as much as 179 teeth (36.38%).

## DISCUSSION

The study was conducted in SMP Negeri 2 PTPN VIII Pangalengan with 122 samples consisting of 81 female students, and 41 male students, ranging from 12-15 years old. Table 1. shows the results of clinical examination on the sample and obtained data amount D that is 492, M data for 35, and data F for 9, so obtained DMF-T index in children aged 12-15 years in SMP Negeri 2 PTPN VIII Pangalengan is of 4.39, which means on average there are 4 permanent teeth with caries, teeth missing and teeth that have been filled on each pupil. It can also be seen in table 4.2 that is respondent with highest percentage is respondent having decay category less than 4 that is 51 peoples (41,8%), and second most is decay category 4-5 counted 37 people (30,3% ).

This figure of 4.39 is much higher when compared with previous research conducted by Sundoro (2005).<sup>9</sup> The result of the research is that the DMF-T index of children aged 12 years in the First Advanced School in Jakarta is only 1.88, and still in. into the low category. It is stated that the knowledge of junior high school children in Jakarta about the importance of maintaining good dental and mouth health when compared with children of SMP 2 Pangalengan.

According to WHO, DMF-T index in children aged 12-15 years in SMP Negeri 2 PTPN VIII Pangalengan is included in the medium category. This moderate category is understandable when it is linked to the questionnaire data about daily tea consumption (appendix 10, table 18), that is 61.5% or 75 children answered tea consumption 3 times a day, and 28.7% 35 children answered consuming milk every day (appendix 10, table 8). Research over the last 10 years against tea, it was found that tea proved to have efficacy in maintaining the health of our bodies. Some of the healthy benefits of tea include: anti dental caries, reducing bad breath and so forth. This is because tea contains polyphenol type Epigallocatechin gallate (EGCG), EGCG has the ability to inhibit the growth of *Streptococcus mutans* and *Streptococcus sobrinus* and prevent the formation and attachment of plaque caused by both caries-causing bacteria (Tjhin and Tjaya-di, 2010; Miller, 2001).<sup>10 11</sup>

Based on table 1. it turns out Decay amount is much more than the amount of Filling. This shows some things, namely, the first is the lack of knowledge of SMP 2 Pangalengan children in taking care of oral health, in this case is the knowledge that the caries teeth should be patched so as not to be damaged even worse. Second, it can also be caused by the location of Puskesmas or other health institutions far from where they live. Third is the lack of motivation in themselves to care for dental caries damaged, this can also be seen from the number of Missing more than Filling. Respondents still had the thought that caries-sick teeth were better for removal than patched, as the cost of patching was more expensive than pulling teeth, and by patching the teeth would only add new problems, without thinking of the risks after tooth extraction either on oral and oral health itself or aesthetically.

All of this is based on Blum's theory of dental and oral health status of a person or society influenced by four important factors: heredity, environment (physical and socio-cultural), behavior, and health services. Behavior plays an important role in influencing the oral health status of the four factors. Behavior may in addition affect the status of dental and oral health directly, may also affect environmental factors and health services (Anitasari and Rahayu, 2005).<sup>12</sup>

The amount of tooth decay that has not been handled and require patching or retraction (RTI) or Required Treatment Index, if seen in table 4.1 is equal to 91.79%. This figure is very high when compared with RTI in West Java which only amounted to 19.9%. The rate of PTI (Perform Treatment Index) or a person's motivation to patch a permanent tooth is 1.68%. This figure is also higher when compared with PTI in West Java which is only 0.9% (Riskasdas West Java, 2007).<sup>3</sup>

The high rate of tooth decay can be attributed to the questionnaire results in appendix 10, tables 14 and 15. Table 14 shows the frequency of respondents who consumed sweet foods such as chocolate / candy, 98.4% of respondents or 120 students answered favored sweet foods. Table 15 shows 41.8% of respondents or as many as 51 students answered consuming sweet foods every day. Chocolate and candy contain very high sucrose. Sucrose is a type of sugar that is often consumed by humans and is very effective in causing caries

(Kidd and Bechal, 2003).<sup>13</sup>

Seen in table 6, respondents who experience the most caries are female respondents with percentage 63,62% and the rest is male respondent with percentage 36,38%. According Finn (2003), at the same age caries in women is higher than men. This is because the teeth in women erupted earlier than men. Therefore, teeth in women are more at risk for caries.<sup>14</sup>

The results showed that the teeth most affected by caries (decay) were molar teeth. It can be seen in Table 4.5 that 53.46% or as many as 263 caries teeth attack the first molar teeth, and the second is second molar with a percentage of 29.07% or as many as 143 teeth. The results of this study are in accordance with the order of caries caries vulnerability level revealed by Burt and Eklund (1992), namely:<sup>15</sup>

1. Lower first and second molar
2. Upper first and second molar
3. lower second premolar, upper first and second molar, and upper central and lateral incisor
4. Upper canine and lower first premolar
5. Lower central and lateral incisor, lower canine

The high prevalence of caries in lower permanent first molars is caused by deep pits and fissures on the occlusal surfaces of teeth, thus facilitating the accumulation of food debris. Foods accumulated in deep pits and fissures will be fermented by bacteria causing demineralization of dental tissue, and over time there will be caries. Another factor that causes the rapid occurrence of caries in the lower permanent first molars is that this tooth is the first permanent tooth to grow, so it is a permanent tooth that is first attacked by caries. A lack of a child's ability to clean teeth well also contributes to the high prevalence of dental caries (Manurung, 2008).<sup>16</sup>

## CONCLUSION

Based on the results of research that has been done, it can be concluded that the DMF-T index in children aged 12-15 years in SMP Negeri 2 PTPN VIII Pangalengan included in the category of moderate.

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