

Determination of Oral Hygiene Status (OHI-S) and Dental Health Status (def-t) of Elementary School Age Children in Bandung City

Emma Rachmawati¹, Ame Suciati Setiawan^{1*}, Ayu Trisna Hayati², Risti Primarti Saptarini³, Dyah Nindita Carolina⁴, Nunung Rusminah⁴

1. Department of Oral Biology, Faculty of Dentistry, Universitas Padjadjaran, Bandung, Indonesia.
2. Department of Operative Dentistry, Faculty of Dentistry, Universitas Padjadjaran, Bandung, Indonesia.
3. Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Padjadjaran, Bandung, Indonesia.
4. Department of Peridontology, Faculty of Dentistry, Universitas Padjadjaran, Bandung, Indonesia.

Abstract

The level of oral hygiene among children can be determined through establishing oral health status characterized by the oral hygiene index (OHI-S) and the number of affected teeth by caries that can be assessed by def-t. This study was to investigate def-t and OHI-S index in school age children in Bandung City. This study was cross sectional with consecutive sample by selecting 211 students of 6-8 years of age from several elementary school in Bandung City. Def-t was evaluated by examining subjects' scored teeth meanwhile simplified oral hygiene index (OHI-S) was determined by Green-Vermillion. The research results show that 56% respondents are male exhibiting the OHI-S mean of 1,13 with def-t mean of 5,09 meanwhile 44% of the female respondents are having OHI-S mean of 0,99 and def-t mean is 3,70. Male students of elementary school in Bandung City possess moderate oral hygiene status with poor dental health status whereas female students have a moderate oral hygiene status as well as their dental status.

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Introduction

World Health Organization have been stating that caries incidence among children reach 60-90% in the year of 2003 and this value might be continuously escalating with age. Many 6-year-old children have suffered from dental caries on their permanent teeth (20%) enhancing to 60% by 8-year-old, 85% at 10-year-old and 90% at 12-year-old. So, it can be concluded that dental caries is a common oral disease in children and if left untreated, it would be a severe complication such as a pain and dentoalveolar abscess.¹ There are many factors will be enhancement of caries prevalence are those oral hygiene, bacteria, saliva and diet pattern which act as a major factor. On the other hand, there would be a modification factors including age, gen, gender, social status and geographic.² FDI

have stated that dental caries is considered as a "behavioral disease with a bacterial component".³ This statement is likely to establish that the role of behavior and bacteria greatly affect the dental caries.

The behavior factor is a crucial factor in providing and maintaining proper oral hygiene that has strongly relation with initiation and progression of dental caries.⁴ The behavior in controlling dental plaque may make an impact on oral microflora which restricts the amount of *Streptococcus mutans* and suppresses the colonization and growth of Gram (-) microorganism playing main role in dental caries process.⁵ The highest priority risk group to dental caries is among children between 11-14 years of age but dental caries actually is a lifetime disease that might start from the very young age.⁶ Anderson and Elliot stated that enamel is resistant to acidic solubility but prolonged exposure to acid will cause enamel demineralization leading to carious lesion. The process of enamel demineralization can be managed by controlling microbial biofilm through plaque measurement. This had been proven by Damyanova et al through their research concluded that the increasing of OHI-S can also

*Corresponding author:

Ame Suciati Setiawan
Department of Oral Biology,
Faculty of Dentistry, Universitas Padjadjaran,
Bandung, Indonesia.
E-mail: ame.suciati@fkg.unpad.ac.id

increase the value of DM-FT index.⁷

Determination of oral health status and dental health status among children is considered as a high priority in dental prevention because it will considerably provide a profound impact in their future quality of life.⁶ The individual effects of oral hygiene status may determine caries-affected teeth. The children who have a good oral hygiene index have exhibited smaller number of decayed teeth compare to those who have a poor one.⁸ Furthermore, untreated or improperly treated caries might be followed by complications leading to premature loos of deciduous teeth among children.⁹ The level of oral health status among children can be determined through establishing oral hygiene index (OHI-S) and the dental health status of deciduous teeth can be assessed by determining def-t. OHI-S is an index used to determine the amount of biofilm present on the scored tooth surface while def-t is the index used to determine the decayed, extracted, and filled primary teeth. Those indexes are two of the most important indexes to determine quantitative factors related to oral health and dental health status. Based on the description above, this epidemiologic studies may thoughtfully contribute in enhancing oral health status and dental health status among children through establishing policy by the authorities based on this studies 'result.

Materials and Methods

The study was a cross-sectional with consecutive sample involving 211 children from 6 to 8 years of age from elementary school in Bandung City. Determination of oral health status was conducted by using the Green-Vermillion simplified oral hygiene index (OHI-S) and dental health status was determined by index of def-t. Children's parents and teacher were asked to fulfill informed consent prior to examination. Oral health status examination was performed by a single examiner using mouth mirror and community periodontal indeks of treatment needs (CPITN) probe. The scored tooth surfaces are 6 surfaces. The OHI-S was established by determination of the debris index and the calculus index representing on selected tooth surfaces. The 6 teeth surfaces scored were classified within 3 debris criteria;

0 – No debris or stain present, 1 – Soft debris covering not more than one third of the

tooth surface, or presence of extrinsic stains without other debris regardless of surface area covered, 2 – Soft debris covering more than one third, but no more than two third, of the exposed tooth surface and 3 – Soft debris covering more than two thirds of the exposed tooth surface.¹⁰

Determination of def-t was conducted by examining decayed (d), exfoliated (e), and filling (f) primary teeth and to gain def-t, all of the examination results were summed up. The def-t were characterized according to WHO: 0,0-1,1 is the lowest score, 1,2-2,6 is the low score, 2,7-4,4 is the moderate score, 4,5 - 6,5 is the high score and > 6,6 is the highest score.¹¹ The data obtained was presented in table and graph.

Ethical and legal considerations of the study:

The project was approved by Scientific Ethic Committee (No: 979/UN6.C.10/PN/2017), Faculty of Medicine, Universitas Padjadjaran in Bandung, Indonesia. All of research's subjects were asked to sign an informed consent through their parents or teacher to comply with the ethical and legal aspects of the research.

Results

The result of this study is presented in table and graph. The students who was involved in this study are 211 with age of 6 – 8. From the overall population, 119 students are male, and 92 students are female. The table below shows that the mean of OHI-S among male students is 1,13 with def-t mean of 5,09 meanwhile the female students have a lower mean of them is that 0,99 for OHI-S and 3,70 for def-t (Table 1).

Gender	Number	Percentage	The mean of OHI-S	The mean of def-t
Male	119	0.56	1.13	5.09
Female	92	0.44	0.99	3.70

Table 1. The mean of OHI-S and def-t of Male and Female of Elementary School Students.

Based on the graph 1, it is seen that the male elementary students have a poorer OHI-S compare to the female students. The graph of Index of def-t as well as the graph of OHI-S shows the same condition exhibiting that the female elementary students have a better index for dental health status compare to the male students.

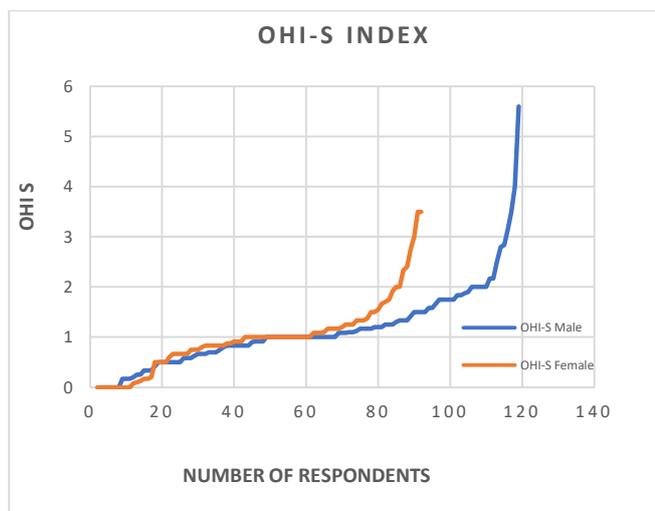


Figure 1. OHI-S Among Male and Female Elementary School Students.

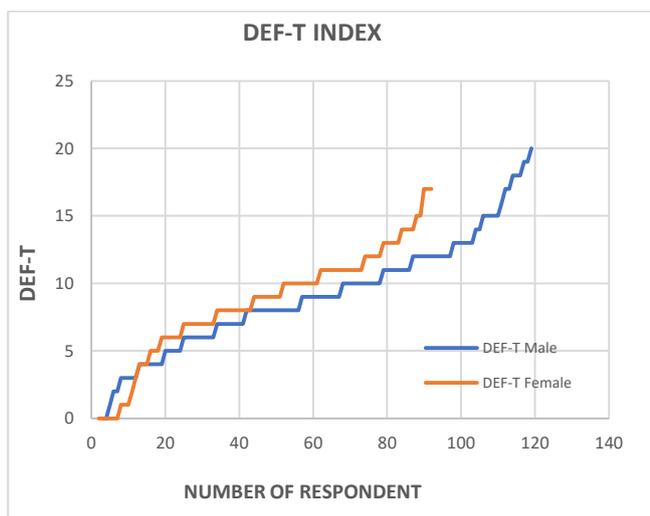


Figure 2. Index of def-t Among Male and Female Elementary School Students.

Discussion

OHI-S is an index created by Green and Vermilion in 1964 now is recognized as equally important in connection to oral health status which is related to dental plaque control especially plaque's quantitative.¹² This index is difference from the original oral hygiene index (OHI) in the number of the scored tooth surfaces is that 6 surfaces rather than 12. The OHI-S criteria is as same as those use for OHI comprising of two components which are the debris index and the calculus index representing the amount of debris and calculus found on selected tooth surfaces. The six surfaces examined for the OHI-S are selected from four

posterior and two anterior teeth. Some researchers have proven that oral health status is highly correlated with dental health status, the more OHI-S increases the def-t rise.^{5,6,13} Agim Begzati, et.al had proved that there is a statistically significant relation between DMFT and OHI index in children in Prishtina, Kosovo.¹⁴ Nevertheless, caries prevalence varies from difference country and region. Many factors might influence it, one of them is geographic variables including race, climate, diet, culture and economic factors. Although the factors that affect dental caries vary, this study attempts to compare the findings of this study with the same study in other regions.¹⁵

The results from the present study show that dental health of male elementary students in Bandung City is worse than that of the female as well as their OHI-S, quite distinct with the result of Agim Begzati research showing that there is no DMFT statistically significant differences based on gender.¹⁴ The mean OHI-S and def-t among the male students was higher in comparison with the female. This differences might be influenced by many factors such as the frequency of tooth brushing, type of tooth brush, dental health behavior and parents' role. This has been proven through previous researches stated that the higher of brushing teeth frequency, the OHI-S tends to decrease.¹⁶ In spite of these results, the individual OHI-S and def-t every student who had participated in this study is really still low. It might due to their diet pattern, the knowledge of the students and their parents about correlation between oral health status and dental health status, so it is necessary to involve the school where the participant are studying and dental health public service centre in educating the students regarding the importance of improving oral health to avoid dental caries.¹⁷

The result of this study may be utilized as a basis for indicating a high dental treatment need among elementary school age children and must improve the establishment of preventive programs with the stress on supervised in enhancing oral health status such as supervising teeth brushing with concentrate fluoride gel in elementary school as well as increasing the awareness about relationship between sugar consumption and caries.^{18,19,20}

OHI-S measurement of this study, on the other hand, showed the mean of 1,13 for male students and 0,99 for female, in total is 1,62

which tell us that the participants of this study have moderate oral health status. But this index remains to become an unsatisfactory result because it still tends to cause dental caries and preferably this index is at below 1 that can only be said to be safe against dental caries. The previous studies have confirmed that there is a connection between socio-economic status and health as well as between it and oral and dental health status. Hence it is confirmed already that a high risk to dental caries related to socio-economic status including low quality of life, low educational level and the impact of cultural life on the promotion of oral and dental health.²¹ The participants of this study are the students of elementary school who come from middle and low economic and environmental level. Despite they have high accessibility to dental service, but the examination of their oral and dental health status has not been satisfactory. Hence, it can be assumed that the result of this study is highly relevant to the connection between socio-economic and oral and dental health mentioned above.

Conclusion

Male students of elementary school in Bandung City possess moderate oral hygiene status with poor dental health status whereas female students have a moderate oral hygiene status as well as their dental status.

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Conflict of Interest

The author declares that there is no conflict of interest

Author Contributions

All authors have contributed both technically and substantially in this research activity. Emma Rachmawati: drafting and designing studies, retrieving data, analyzing and interpreting data, writing and revising articles,

giving final approval of article publishing. Ame Suciati: revising and editing articles. Ayu Trisna Hayati: data retrieval and oral presentation of articles. Risti Saptarini: data retrieval. Dyah Nindita Carolina: data retrieval and article revision. Nunung Rusminah: data retrieval.

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