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## RESEARCH ARTICLE

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# The Profile of Oral and Dental Health of Children in the Agroindustrial Environment in Jember

Berlian Prihatiningrum<sup>1</sup>, Niken Probosari<sup>2(CA)</sup>, Sulistiyani<sup>3</sup>, Dyah Setyorini<sup>4</sup>, Roedy Budirahardjo<sup>5</sup>, Sukanto<sup>6</sup>

<sup>1</sup>Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Jember, Indonesia; [berlian.fkg@unej.ac.id](mailto:berlian.fkg@unej.ac.id)

<sup>2(CA)</sup>Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Jember, Indonesia; [niken.probosari.fkg@unej.ac.id](mailto:niken.probosari.fkg@unej.ac.id) (Corresponding Author)

<sup>3</sup>Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Jember, Indonesia; [sulistiyani.fkg@unej.ac.id](mailto:sulistiyani.fkg@unej.ac.id)

<sup>4</sup>Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Jember, Indonesia; [drg.dyahsetyorini.fkg@unej.ac.id](mailto:drg.dyahsetyorini.fkg@unej.ac.id)

<sup>5</sup>Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Jember, Indonesia; [roedy.fkg@unej.ac.id](mailto:roedy.fkg@unej.ac.id)

<sup>6</sup>Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Jember, Indonesia; [196510271996011001@mail.unej.ac.id](mailto:196510271996011001@mail.unej.ac.id)

## ABSTRACT

Oral and dental health is one of the important components to improve a person's quality of life. The aim of this study is to describe the oral and dental health status in Children who lived In Agroindustrial environment in Jember. This study was an analytical descriptive research. The subjects used were 255 students in 3 elementary schools. The sampling technique used was total population sampling. Data obtained by questionnaire and direct examination in the form of examination of DMF-t or def-t index and oral hygiene index. Then the data tabulation was carried out using table. Based on the caries index, it shows that children in the coffee and cocoa agro-industry environment had a low category caries in permanent teeth (mean DMF-t = 1,6), mean while in deciduous teeth included in the moderate category caries (mean def-t = 4,11). The profile of oral and dental health status in Children who lived in agroindustrial environment need to improve.

**Keywords:** oral health status; agroindustrial environment; children

## INTRODUCTION

Dental and oral health problems are one of the determinants of children's quality of life. The incidence of caries in developing countries is still very high and is a major dental and oral health problem in children, one of which is in Indonesia. According to the World Health Organization (WHO) in 2012, the most common oral diseases experienced by children are dental cavities (caries) and periodontal disease. <sup>(1)</sup> In Indonesia, the prevalence of dental caries in school-age children tends to increase. Based on the Basic Health Research (Riskesmas) of the Indonesian Ministry of Health in 2018, there was an increase in 2013 by 25.9% to 54% at the age of 5-9 years, with a total prevalence of dental caries almost 93% of children aged 5-9 years experiencing dental caries and 28.5% had root caries. <sup>(2)</sup> The 2018 Riskesdas report shows that the average Decay Missing and Filling (DMF-T) score in Indonesia is 7.1 at all ages, an increase compared to the 2013 Riskesdas result of 4.6. DMF-t index in children aged 5-9 years is 0.7. The DMF-T score of 0.7 indicates that there is 7 tooth decay per 100 children. The prevalence of active caries for East Java itself according to Riskesdas in 2018 was 42.4%. These results indicate that the incidence of caries in East Java is still very high. <sup>(3)</sup>

For over 70 years, the Decayed, Missing and Filled Teeth (DMFT) index has been globally used as the most important index for assessing the status of oral and dental health. Moreover, this index is the most important index used in epidemiological studies of the health status of the community. <sup>(4)</sup> This index determines the number of decayed teeth, the number of treated teeth, and the number of teeth missed due to decay. <sup>(5)</sup> This index is used

to evaluate and monitor oral health interventions in the community by developing policies and programs related to this area. <sup>(6,7)</sup>

The Jember Regency area has enormous agricultural and plantation potential. Plantation commodities such as sugar cane, coffee, tea, cocoa, and rubber are produced by state-owned, private-owned and community-owned plantations. <sup>(8)</sup> According to Siregar (2013), <sup>(9)</sup> the agricultural and rural sectors are places of livelihood for the majority of the people with the lowest 30% welfare status. Rural industrialization is often associated with agro-industry because agro-industry is one of the strategies for rural industrialization. In the framework of agricultural development, agro-industry is the main driver of the development of the agricultural sector, especially in the future the position of agriculture is the mainstay sector in national development so that the role of agro-industry will be even greater. <sup>(10,11)</sup> As a district with the majority of its people's livelihood being farmers and industrial workers of agricultural products, various efforts to improve the welfare of the community need to be carried out, especially improving health starting from children. Efforts to improve the quality of human life in relation to improving family welfare is not an easy matter. Geographical, social and cultural conditions that surround the life of the family where the family lives, greatly affect his assessment of family welfare. <sup>(12)</sup> One of the determinants of family welfare is the fulfillment of public health starting from the childhood phase.

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. <sup>(13)</sup>

The aim of this study is to describe the oral and dental health profil of Children who living in agroindustry in Jember.

## METHODS

This type of research was a cross-sectional study. The population was determined at three Elementary School in the coffee and cocoa agro-industry areas in the Ajung and Rambli Puji areas. Total participants in this study were 255 children aged 6-13 years. Participants were taken based on total population sampling. The preparation stage for this research includes obtaining permits to related agencies and ethical clearance as well as initial screening according to the Covid-19 health protocol. This study was conducted by means of closed interviews and questionnaires, followed by an oral examination, which included an assessment of dental caries index and oral hygiene in these participants. 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 and DMF-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. <sup>(13,14)</sup>

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. <sup>(13,14)</sup>

Determination of def-t and DMF-t was conducted by examining decayed (d), exfoliated (e), and filling (f) primary teeth and to gain def-t, while DMF-t performed by examining Decayed (D), Missing (M) and Filling (F) permanent teeth and to gain as DMF-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. <sup>(13,14)</sup> The data obtained was presented in table. Ethical and legal considerations of the study: The project was approved by Scientific Ethic Committee (No: 1275/UN25.8/KEPK/DL/2021), Faculty of Dentistry, Universitas jember in Jember, Indonesia.

## RESULTS

After collecting 255 participants as the population, several of these were excluded due to exclusion criteria and maternal unavailability as study subjects. Then, 255 participants were obtained that matched the inclusion criteria. The study participants, as the parents of the students and the students, gave informed consent; hence, they filled out the questionnaire honestly. The participants filled out the questionnaire, assisted by the researcher's explanation beforehand.

In conformity with the requirements of selection, 255 students opted to participate in this study. Table 1 represents the frequency of participants status based on Age, gender and School. Participants status showed the highest number of 11 years Old as participant (23,5%), followed by 7 Years Old participants (17,3%), and the smallest participant is 6 Year Old (1,2%) (Table 1). Male patients were the more dominant part of sample

(52,2%), compared to girls (47,8%). There were 142 boys and 113 girls in total participants. Elementary School showed the highest number is Nogosari 2 Elementary School (49%).

Table 1. The Distribution of participant by age, gender and school

Characteristic	Frequency	Percentage
Age		
6 years	3	1.2
7 years	44	17.3
8 years	36	14.1
9 years	30	11.8
10 years	35	13.7
11 years	60	23.5
12 years	40	15.6
13 years	7	2.8
Gender		
Male	133	52.2
Female	122	47.8
School		
Mangaran 2	78	30.6
Nogosari 2	125	49
Nogosari 7	52	20.4

Table 2. Distribution of DMF-t index and def-t index based on age, gender and school

Characteristic	DMF-t index	def-t index
Age		
6 years	0	8.67
7 years	0.77	9
8 years	1.19	6.97
9 years	1.37	5.43
10 years	2.2	3.49
11 years	2.25	1.83
12 years	2.38	1.13
13 years	3.14	1.03
Gender		
Male	1.38	5
Female	2.02	3.76
School		
Mangaran 2	1.48	4.59
Nogosari 2	1.82	5.07
Nogosari 7	1.61	2.67

The table 2 showed that the most higher DMF-t Index found in 13 Years Old children (3,14) and the lowest DMF-t index is in 6 Years children (0). Followed with the highest def-t index in 7 Years Old Children. Based on Gender, Highest DMF-t index showed in Female (2,02), meanwhile the highest def-t index showed in Male (5). Based on School, the highest DMF-t index and def-t Index Found in Nogosari 2 Elementary School.

Based on table 3, it was found that the oral hygiene index (OHI) data based on age, the most OHI category is moderate in all aged. Based on gender, it was found that moderate category of OHI found both in male and female (25,88% and 21,96%). While based on the Schools distribution, it was found that all of the School included the moderate category of OHI.

Table 3. Distribution of OHI based on age, gender and school

Characteristic	Oral Hygiene Index (OHI)							
	Good		Moderate		Poor		Total	
	N	%	N	%	N	%	N	%
Age								
6 years	2	0.78	1	0.39	0	0	3	1.17
7 years	22	8.63	21	8.24	2	0.78	45	17.65
8 years	12	4.7	20	7.84	3	1.17	35	13.73
9 years	10	3.92	16	6.27	4	1.57	30	11.76
10 years	10	3.92	15	5.88	9	3.53	34	13.33
11 years	21	8.24	29	11.37	11	4.31	61	23.92
12 years	20	7.84	16	6.27	4	1.57	40	15.69
13 years	3	1.17	4	1.57	0	0	7	2.75
Gender								
Male	50	19.61	66	25.88	17	6.67	133	52.16
Female	50	19.61	56	21.96	16	6.27	122	47.84
School								
Mangaran 2	29	11.37	36	14.12	13	5.1	78	30.59
Nogosari 2	50	19.61	63	24.71	12	4.71	125	49.01
Nogosari 7	18	7.06	24	9.41	10	3.92	52	20.4

## DISCUSSION

Oral and dental health is one of the supporting component to improve children's quality of life. Which are included in the healthy criteria for oral and dental health are low caries status and high oral hygiene. Childhood is golden age that is prone to problems related to teeth and mouth. If this is allowed, then poor oral and dental health can affect children's health in general. Dental caries prevalence and severity was investigated using dft and DMFT indices. The observed dft and DMFT values of the children were well within the national and WHO goals. The oral health status was observed using Oral Hygiene Index (OHI).

Based on the table 1, it was found that the most participants were children aged 11 years (23,5%) and the lowest were children aged 6 years (1,2%). This because of the pandemic factor, where many participants did not fill out informed consent and some did not meet the research requirements, including being sick and not being present when the study was conducted. While from gender, male is the most highest participants than female. From the school distribution, Nogosari 2 Elementary School is the highest participants number. This distribution from school influences by the number of student. In Mangaran 2 Elementary School have the smallest number of student, because the location of this school is inside in the Renteng Plantation with the smallest population who living nearby than the other school.

From the table 2, it was showed that the highest DMF-t index based on Age is on 13 years children and the highest def-t index is on the 7 years children. The DMFt index was 1,66 in all participants and the def-t index was 4,69 in all participants. Which is unfavorable according (WHO).<sup>(13,15)</sup> this difference might to be attributed to the increase in people's access (physical, financial, and cultural access) to oral health care which has led to an improvement in the economic status of the people and increased their mean education level over the last decades. The factors that influences the high number of DMF-t index and def-t index include oral hygiene factor (tooth brushing frequency, using dental floss, using mouthwash), consumption patterns of cariogenic diet, salivary pH, economic status, age group, parental education and individual education.<sup>(16)</sup> The findings of this study showed that as age increases, the DMFT index becomes more unfavorable.<sup>(15)</sup> With aging, the number of decayed, missed, and filled teeth normally increases; thus, the WHO sets a higher DMFT index for people of polder ages.<sup>(17)</sup> With increasing the age, the DMFT index was higher. In addition, some other studies have reported the relationship between older age and poorer oral health status.<sup>(18,19)</sup>

The DMF-t index in female highest than male, while the def-t index male highest than female. It was observed that dft index was higher in males compared to females but there was no significant difference was found. For the DMFT index, it was significantly higher in females compared to males ( $p < 0,01$ ). These results were similar to the study done by in Eastern part of Nepal and Bhaktapur Nepal.<sup>(20)</sup>

Nogosari 2 Elementary School showed the highest both in DMF-t and def-t index than the other School. This influence by the number of participants in Nogosari 2 more higher than the other school. The lowest DMF-t index showed from Mangaran 2 Elementary School, this influence that the socioeconomic status of the parents in Mangaran 2 Elementary School better than 2 other School and the parents education higher than 2 other School. Most of the parent from Mangaran 2 Elementary School is High School Graduate and Bachelor Degree.

The moderate category was the most category of OHI based on age (122 participants, 47,84%). The poor category of OHI is 33 participants (12,94%). While the Good category was 100 participants (39,22%). 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.<sup>(21)</sup> The OHI based on gender and School showed that both group most had a moderate category. On the contrary, the oral hygiene status of males was slightly better than that of females in 2010. Meta-analysis of the data indicated that males had in summary higher OHI-S score than females (summary mean: 0.133) but this difference did not reach statistical significance.<sup>(22)</sup> The finding that females had more positive behavior than males concerning brushing frequency was in accordance with those reported for dental students of several other countries although in most of these studies, sex differences were greater.

In spite of these results, the individual OHI-S and def-t or DMF-t every student who had participated in this study is really still need to improve. 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.<sup>(23)</sup> OHI-S measurement of this study, on the other hand, which tell us that the participants of this study have moderate oral health status. But this index remains to becomes 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.<sup>(22)</sup> The profile of oral and health status elementary school children in the agroindustrial environment in Jember possess moderate oral hygiene status with low caries dental health status in permanent teeth and moderate caries in deciduous teeth, whereas the healthy of oral and dental in children need to improve to generate the quality of their life.

## CONCLUSION

The profile of oral and health status elementary school children in the agroindustrial environment in Jember possess moderate oral hygiene status with low caries dental health status in permanent teeth and moderate caries in deciduous teeth, whereas the healthy of oral and dental in children need to improve to generate the quality of their life.

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