

THE 5th INTERNATIONAL CONFERENCE ON HEALTH POLYTECHNICS OF
SURABAYA (ICOHP)

2nd International Conference of Dental and Oral Health(ICO DOH)

**Effect of Nutritional Status on Delay in Eruption of Permanent M1
Teeth in Grade 1 Elementary School Students
(Study at Kutisari Village Elementary School, Surabaya)**

Ajeng Hayu Pratiwi¹, Ida Chairanna Mahirawatie², Bambang Hadi
Sugito³ *Dental Health Department of Politeknik Kemenkes Surabaya*
Corresponding author: ajenghayuu@gmail.com

ABSTRACT

Delayed tooth eruption is a delay in the growth of teeth towards the oral cavity which begins when the teeth are still in the oral cavity. The eruption time of the permanent M1 teeth is when the child is 6-7 years old. When the permanent M1 tooth erupts, if it doesn't fit properly, the growth of a person's body can generally be said to be stunted. Objective: to determine the effect of nutritional status on delayed eruption of permanent M1 teeth in grade 1 elementary school students in Kutisari Village, Surabaya. Method: The type of research used is the cross sectional method with purposive sampling technique and obtained a sample of 159 respondents. This research was conducted on grade 1 elementary school students in Kutisari Village, Surabaya in April 2022. Data processing and analysis techniques were carried out using the Kruskal-Wallis test. Results : There was no influence of nutritional status on the delayed eruption of the maxillary permanent M1 teeth, while on the mandibular permanent M1 there was an influence of nutritional status on the delay of eruption of the permanent M1 teeth in grade 1 elementary school students in Kutisari Village, Surabaya. Conclusion : Most of the respondents have poor nutritional status and experience delayed eruption of permanent M1 teeth, it is necessary for parents to play a role in parenting their children's diet.

Keywords : Nutritional Status, Tooth Eruption, Students

BACKGROUND

The eruption of one's teeth reflects the general growth of the body. When a person experiences delayed tooth eruption, the growth of a person's body can generally be said to be hampered (Badruddin et al., 2017).

Tooth eruption is the movement toward the oral cavity that begins when the teeth still in the jawbone. Eruption is a continuous process begins as soon as the crown is formed (Wangidjaja, 2014).

The eruption of permanent M1 teeth in grade 1 elementary school students in Kutisari Village at Bethel Sulung 3 Christian Elementary School, Eleos Christian Elementary School, and Bisma Dua Elementary School Surabaya showed that in tooth 16 there were 14 students (42.4%) who had not erupted, there were 11 students. (33.3%) whose eruption was not perfect, there were 8 students (24.3%) who had a perfect eruption. In tooth 26 there were 15 students (45.4%) who had not erupted, there were 10 students (30.3%) who had incomplete eruption, there were 8 students (24.3%) who had fully erupted. In tooth 36 there were 23 students (69.7%) who had not erupted, there were 3 students (9.1%) who had incomplete eruption, there were 7 students (21.2%) who had fully erupted. In tooth 46 there

were

23

students (69.7%) who had not erupted, there were 3 students (9.1%) who had incomplete eruption, there were 7 students (21.2%) who had fully erupted.

Molars or first permanent molars are the first permanent teeth to erupt when a child is 6-7 years old, or at the same time as the first incisor or 1 (one) incisor. The first permanent molars or molars grow behind the milk molars (Pangarso, 2017).

Factors that influence tooth eruption are nutrition, genetics, and hormones. Malnutrition can delay tooth eruption in low socioeconomic populations and tooth age may reflect age-comparable physiological assessments based on skeletal development, weight or height (Rajendran, 2020).

Good nutritional status of children occurs because the food consumed contains nutrients in sufficient quantities for the body's needs and there is a balance between the amount of energy that enters the body and the energy released from outside the body according to individual needs (Zakiyah et al., 2017).

At the beginning of the age of 6 years the child begins to enter school and enters a new world, where he begins to relate a lot to people other than his family and socialize with the new atmosphere and environment in his life and has many activities. This greatly affects their eating habits (Ariani, 2017).

Parents always assume that the permanent teeth that grow always shake the milk teeth first, even though the eruption of the molars or first permanent molar grow on its own without moving its milk teeth. If there is a delay in the eruption of the tooth, it will have an impact on the child's masticatory system.

Eruption of molars or first permanent molar This needs special attention for parents, taking into account the nutritional status of their children. The nutritional status of children can be improved by paying attention to their child's diet. Here the role of parents is very important in providing the presentation of food menus and paying attention to what foods their children will consume.

Researchers are interested in researching the effect of nutritional status on delayed eruption of permanent M1 teeth in grade 1 elementary school students in Kutisari Village, Surabaya because parenting plays an important role in maintaining tooth development and growth.

RESEARCH METHODS

This research has been approved by the Health Research Ethics Commission of the Polytechnic of Health Surabaya No.EA/1249/KEPK-Poltekkes_Sby/V/2022. The research method used is cross sectional method with non-parametric Kruskal-Wallis statistical test. With the statistical test with a confidence level of (0.05). The population in this study were grade 1 elementary school students in Kutisari Village, Surabaya, that is Bisma 2 Elementary School, Eleos Christian Elementary School, Bethel Sulung 3 Christian Elementary School, Saroja Islamic Elementary School, Kutisari I State Elementary School and Kutisari II Elementary School with a total sample of 159 students. The sampling technique in this research is purposive sampling

RESULTS AND DISCUSSION

The research data was obtained from an examination of grade 1 students regarding the nutritional status of the permanent M1 teeth.

Table 1 Frequency Distribution of Respondents' Characteristics at Elementary Schools in Kutisari Village, Surabaya in 2022

Characteristics	Frequency	%
Gender		
• Man	73	45.9
• Woman	86	54.1
Age		
• 6 years	7	4.4
• 7 years	103	64.8
• 8 years	49	30.8

Based on table 1, it is known that the research subjects amounted to 159 respondents and most of the respondents were female with 86 respondents (54.1%) and most of the respondents aged 7 years with a total of 103 respondents (64.8%).

Table 2 Frequency Distribution of Children's Nutritional Status Categories at Elementary Schools in Kutisari Village, Surabaya in 2022

No.	Category Nutritional Status	Frequency	%
1.	Not enough	74	46.5
2.	Well	58	36.5
3.	More	17	10.7
4.	Obesity	10	6.3

Based on table 2, it is known that most of the respondents have poor nutritional status as many as 74 respondents (46.5%).

This can also be supported by a statement which states that most mothers who have poor knowledge apply poor food parenting to their children. Although mothers have good knowledge about nutrition, the food parenting they apply is not good because of the lack of time for mothers to pay attention to their children because some mothers work outside the home so that directly and indirectly it is the main cause of malnutrition in children.(Izhar, 2017).

The ability of parents to buy groceries depends on the size of their income. In addition, the level of income can determine the pattern of eating. Parents with limited income cause their food purchasing power to be low so they are unable to buy the required amount of food and in the end this has a bad impact on the nutritional status of their children under five. Conversely, the higher the income of parents, the nutritional needs of family members can be guaranteed (Wandani et al., 2021).

Table 3 Frequency Distribution of Categories of Permanent M1 Tooth Eruption in Elementary Schools in Kutisari Village, Surabaya in 2022

M1 Permanent Teeth	Category Permanent M1 Tooth Eruption							
	1		2		3		4	
	F	%	F	%	F	%	F	%
16 . teeth	69	43.4	62	39	0	0	28	17.6
26 . Teeth	69	43.4	62	39	0	0	28	17.6
36 . teeth	75	47.2	57	35.8	0	0	27	117
46 . teeth	75	47.2	57	35.8	0	0	27	17
Total	288	45.3	238	37.4	0	0	110	17.3

Based on table 3, it is known that most of the respondents have the first category in the eruption of M1 teeth, namely the teeth have not been seen in the oral cavity with a total of 288 teeth (45.3%).

Table 4 Grouping of the eruption of tooth 16 and tooth 26 with nutritional status in elementary schools in Kutisari village, Surabaya in 2022

Nutritional status	Category Eruption Tooth 16 and Tooth 26									
	1		2		3		4		Total	
	F	%	F	%	F	%	F	%	F	%
Not enough	38	51.4	30	40.5	0	0	6	8.1	74	46.5
Well	24	41.4	20	34.5	0	0	14	24.1	58	36.5
More	6	35.3	8	47.1	0	0	3	17.6	17	10.7
Obesity	1	10	4	40	0	0	5	50	10	6.3
Total	69	43.4	62	39	0	0	28	17.6		

Based on table 4, it is known that most of the respondents have the first category in the eruption of M1 teeth, namely teeth that have not been seen in the oral cavity on tooth 16 and tooth 26 as many as 69 respondents (43.4%) with poor nutritional status as many as 74 respondents (46.5%) .

Table 5 Grouping of Eruption of Tooth 36 and Tooth 46 with Nutritional Status in Elementary Schools in Kutisari Village, Surabaya in 2022

Nutritional status	Category Eruption Tooth 36 and Tooth 46									
	1		2		3		4		Total	
	F	%	F	%	F	%	F	%	F	%
Not enough	41	55.4	27	36.5	0	0	6	8.1	74	46.5
Well	30	51.7	15	25.9	0	0	13	22.4	58	36.5
More	4	23.6	10	58.8	0	0	3	17.6	17	10.7
Obesity	0	0	5	50	0	0	5	50	10	6.3
Total	75	47.2	57	35.8	0	0	27	17		

Based on table 5, it is known that most of the respondents have the first category in the eruption of M1 teeth, namely teeth that have not been seen in the oral cavity on tooth 36 and tooth 46 as many as 74 respondents (47.2%) with poor nutritional status as many as 74 respondents (46.5%) .

This can be supported by the statement which states that the environment can affect the

delay in the eruption of the deciduous teeth, namely a group of families who live in industrial

areas that have excessive Co (cobalt) content which can interfere with the formation of dentin since in the womb.(Wu, et al., 2020).

In the tooth formation phase, this nutrient is an important factor that must be present because it will later affect the occurrence of the tooth eruption phase (Zakiyah et al., 2017).

Table 6 Kruskal-Wallis Test Results Effect of Nutritional Status on Permanent M1 Tooth Eruption in Grade 1 Elementary School Students in Kutisari Village, Surabaya in 2022

	16 . teeth	26 . Teeth	Teeth 36	46 . teeth
Kruskal-Wallis H	14,591	15,237	14,794	15,011
<i>p-value</i>	.008	.008	.001	.001

Based on table 6, the p-value shows that in tooth 16 and tooth 26 it is 0.008, while in tooth 36 and tooth 46 it is 0.001. *Sop-value* > 0.05, it can be concluded that there is an effect of nutritional status on the eruption of permanent M1 teeth in grade 1 elementary school students in Kutisari Village, Surabaya.

This is also supported by a statement which states that the largest number of unerupted teeth is found in children who have underweight nutritional status because if the intake of nutrients obtained by the child is not appropriate, it will have an impact on the child's growth pattern, both in general and specifically in children. eruption of permanent teeth in the oral cavity (Zakiyah et al., 2017).

In the group of children who have underweight nutritional status also shows that there is a delay in the eruption of permanent M1 teeth compared to children who have obese nutritional status or vice versa which shows an acceleration in the eruption of permanent M1 teeth. This is because body composition plays an important role in the eruption of permanent teeth(Prijatmoko & Zakiyah, 2019).

Table 7 Kruskal-Wallis Test Results Effect of Nutritional Status on Delayed Eruption of Permanent M1 Teeth in Grade 1 Elementary School Students in Kutisari Village, Surabaya in 2022

	16 . teeth	26 . Teeth	Teeth 36	46 . teeth
Kruskal-Wallis H	9,866	10,625	13,134	13,056
<i>p-value</i>	.073	.073	.002	.002

Based on table 7 obtained *p-value* it shows that on tooth 16 and tooth 26 it is 0.073, while on tooth 36 and tooth 46 it is 0.002. *Sop-value* > 0.05, it can be concluded that there is no effect of nutritional status on the eruption of teeth 16 and 26, while on teeth 36 and 46 there is an influence of nutritional status on the delay in eruption of permanent M1 teeth in grade 1 elementary school students in Kutisari Village, Surabaya.

This is also supported by the statement that the maxillary teeth erupt earlier than the mandibular teeth due to ethnic diversity, where growth and development patterns are not universally applied (Khan et al., 2020).

CONCLUSION AND RECOMMENDATION

The conclusion of this study is that most of the grade 1 elementary school students in the Kelurahan have poor nutritional status and there is a delay in the eruption of the permanent M1 teeth. There is no effect of nutritional status on the delayed eruption of the maxillary permanent M1 teeth, while on the mandibular permanent M1 there is an influence of nutritional status on the delay of eruption of the permanent M1 teeth in grade 1 elementary school students in Kutisari Village, Surabaya.

It is recommended to the school at the Kutisari Village Elementary School, Surabaya to further increase activities at UKS, such as checking height and weight regularly as well as School Dental Health Efforts (UKGS) activities. It is necessary to collaborate with the nearest puskesmas to provide counseling to students and parents of students at the Kutisari Village Elementary School, Surabaya regarding food parenting and dental and oral health. The role of parents is also important to pay more attention to their child's diet so that they have good nutritional status and their child's dental growth.

REFERENCES

- Ariani, AP (2017). Science of nutrition. Noah Medika.
- AS Khan, P. Nagar, P. Singh, and M. Bharti (2020). "Changes in the sequence of eruption of permanent teeth; correlation between chronological and dental age and effects of body mass index of 5–15-year-old schoolchildren," *Int. J. Clin. pediatrician. Dent.*, vol. 13, no. 4, pp. 368–380, doi:10.5005/jp-journals-10005-1797.
- Badruddin, IA, Putri, MR, & Rahardjo, A. (2017). Factors Associated with Primary Teeth Eruption Pattern in Children Under Three Years Old in Beji Depok, West Java. *Journal of International Dental and Medical Research*, 564-568.
- D. Prijatmoko and F. Zakiyah (2019). "Role of body composition on the eruption time of first permanent molars," *J. Int. Dent. Med. Res.*, No. 4, pp. 1563–1567.
- Fakhirouz Zakiyah, DP (2017). The Effect of Nutritional Status on the Eruption of Permanent First Molars in Class 1 SDN Students in the District of Jember City Administration. *e-Journal of Health Library*.
- Pangarso, PR (2017). *Healthy Body, Teeth?*. Qanita PT Mizan Pustaka.
- Rajendran, D. (2020). Eruption Pattern of Permanent Molars among School Children in Chennai. *Indian J. Forensic Med. Toxicol.*, , vol. 14, no. 3, pp. 2191–2196, 2020, doi:10.37506/ijfmt.v14i3.10757.
- Wangidjaja, I. (2014). *Dental Anatomy Edition 2*. EGC Medical Book Publisher. 294-326.
- Wu, H., Xu, B., Guan, Y., Chen, T., Huang, R., Zhang, T., Sun, R., Xie, K., & Chen, M. (2020). A metabolomic study on the association of exposure to heavy metals in the first trimester with primary tooth eruption. *Science of the Total Environment*, 723. <https://doi.org/10.1016/j.scitotenv.138107>
- Zakiyah, F., Prijatmoko, D., & Novita, M. (2017). The Influence of Nutritional Status on the Eruption of Permanent First Molars in Class 1 Elementary School Students in the District of Jember City Administration. (The Influence of Nutritional Status towards the First Permanent Molar Tooth Eruption Among 1st Grade Students in Jember Elementary School), *Jurnal. Unej.Ac.Id*, vol. 5, no. 3, pp. 469–474, 2017.