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Prevalence of Permanent Single Molar Dental Caries in Elementary School Students Assisted by The Robatal Health Center Aged 8-10 Years

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Abstract
Introduction: *dental caries is one of oral health problems. First molar is the permanent teeth that first erupted at around 6 – 7 years old, so it can be the most at risk for caries. The prevalence of first molar permanent caries in children aged 8 – 10 years is the number of people in a population waho have dental caries.* ***Objective:*** *the purpose of this study to know the prevalence of first molar permanent caries in children aged 8 – 10 years in Elementary School, there are 01 Robatal, 02 Robatal, Nurul Ulum and Nurut Tauhid in Augustus 2024.* ***Method:*** *the type of this research is observational descriptive. Population of this research are all of the students aged 8 – 10 years old. Purposive sampling is used for sampling method.* ***Result and Discussion:*** *the results of first permanent molar caries in children aged 8 – 10 years have been obtained through objective examination. From 236 samples, there are 944 teeth of first permanent molars and the results have shown that 108 first permanent molar caries in children aged 8 years, 233 molars caries at age 9 years old and 137 molars caries at age 10 years old.* ***Conclusion:*** *from the research that has been done, it can be concluded that the causes of dental caries is still high are lack of knowledge and awareness, both children and parents in maintening and treatment oral hygiene.*
Keywords: Prevalence; First Molar Permanent; Children;

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Introduction

Currently, several key performance indicators (KPIs) of local governments in Madura show an unencouraging trend. The achievement of the Human Development Index (HDI) in four districts in Madura in 2020 is worse than the average achievement of East Java Province (Statistics, 2020) in (Hariyani et al., 2022). In fact, the position of Sampang and Bangkalan Regencies is at the bottom of East Java (Statistics, 2020). In the formulation compiled by the Central Statistics Agency (BPS), HDI is a composite index composed of several aspects, namely health, education and people's purchasing power (Statistics, 2020). Of the three components, the four districts in Madura occupy the bottom 6 positions in East Java (Statistics, 2020). Dental and oral health problems are closely related to people's productivity. Data in Madura Dental and oral health problems are closely related to community productivity.

Coverage The ratio of tooth extraction and fillings with cavities or dental caries in Sampang Regency is still below the target of 0.7 with a minimum target of 1 according to the health profile data of the East Java Health Office in 2022, so that there are still many Sampang residents who have cavities extracted compared to those who take care of caias teeth. Dental and oral health problems are closely related to people's productivity. (Depkes RI. 2022), In addition, dental and oral health is also very related to appearance, and quality of life (Shafira, 2020)

Dental caries occurs due to damage to the hard tissues of the teeth which include enamel, dentin, and cement. The tooth decay process begins with a demineralization process followed by the destruction of organic substances so that bacteria develop (Lestary & Idealistian, 2022). Children aged 6–14 years are vulnerable to dental and oral diseases because generally these children still have the habit of snacking food and drinks both at school and at home (Wulandari, Putri, Amalia, & Rahmadhianie, 2019)

Tooth decay is increasing due to food/dietary factors that trigger tooth decay such as soft drinks and candies. In addition, carbohydrates play an important role in the occurrence of caries in the teeth. Snacks are one of the factors that affect the occurrence of dental caries (Hope & Mamonto, 2021). Frequent and repeated consumption of cariogenic foods will cause the pH of the plaque to remain below normal and cause the demineralization of the enamel without being balanced by remineralization, resulting in the formation of caries. Behavior in brushing teeth, the type of food consumed and knowledge are closely related to the status of dental and oral health. Low knowledge has a higher risk of developing dental disease than good knowledge. Based on the results of a survey from the Kesgimul Profile Report in Indonesia, the lack of knowledge and understanding about the maintenance of dental and oral health is the cause of the high prevalence of dental caries in children aged 6-12 years (Rama,4th, & Susilawati, 2017)

The molar of one lower jaw is the first permanent tooth to erupt at about 6-7 years old, making it the most vulnerable tooth to caries. If the tooth is affected by caries, it can result in extraction, which poses new risks such as changes in tooth position, affecting occlusion, jaw joints, and the mastication process which has an impact on the absorption of food nutrients (Abdat, 2018).

This tooth is the largest tooth and has just erupted after the growth and development of the jaw is enough to make room for it. The first permanent molars function for chewing, pounding, and grinding food because they have a wide chewing surface with many bumps and indentations (Al Falah, Prihatiningrum, & Nugroho, 2022)

Method

The type of research used in this study is observational descriptive. This research was conducted at Elementary School 01 Robatal, Elementary School 02 Robatal, Mi Nurut Tauhid and Mi Nurul Ulum in August 2024. The population studied in this study is all school children aged 8-10 years. The sampling method used in this study is *purposive sampling*, sample selection is adjusted to certain criteria applied based on the purpose of the research.

The inclusion criteria in this study are being present in the classroom at the time the research is carried out, cooperative during data collection, physically healthy, and one permanent molar tooth has erupted completely. The exclusion criteria are not allowed by parents, using orthodontic devices, permanent molar teeth do not grow (do not have seeds). The data collection used is primary data obtained directly in the field during observation, the data collection is recorded directly to the inspection form.

Dental caries examination is carried out permanently under good lighting, then to detect dental caries the examination is carried out with oral glass and sonde. A permanent molar tooth is examined and noted when it has caries. After all the data from the research sample is collected, then descriptive data analysis is carried out to provide a description of the research subject based on data from variables obtained from the group of subjects studied.

Results and Discussion

Result

This research was conducted in elementary schools assisted by the Robatal Health Center, namely Mi Nurut Tauhid, Mi Nurul Ulum, Elementary School 01 Robatal and Elementary School 02 Robatal. The characteristics of the subjects in this study are students aged 8-10 years, the total population in this study is 243 children, the research sample studied is 236 children. The results of the research from the distribution of subjects can be seen in the following table.

Table 1

Research Frequency Distribution (N=236)

Age	n	%
8 Years	65	27.5
9 Years	97	41.1
10 Years	74	31.4
Total	**236**	**100**

Table 1 shows that the most research subjects are in the 9-year-old age group as many as 97 children (41.1%). Meanwhile, the fewest research subjects were in the 8-year-old age group, which was 65 children (27.5%).

Table 2
Frequency Distribution by Gender (n=236)

Gender		N	%
Man	Dental Caries	80	33.9
	No Dental Caries	29	12.3
Woman	Dental Caries	67	28.4
	No Dental Caries	60	25.4
		236	100

Table 2 shows that the research subjects who found the most caries in the first molar teeth of harvesters were 80 boys (33.9%)

Table 3
Distribution of Permanent Molar Dental Caries in 8-Year-Old Children

Permanent first molar dental caries	n	%
Right RA	14	12.9
Left RA	22	20.4
Right RB	27	25
RB left	45	41.7
	108	100

Table 3 explains that at the age of 8 years who experience the most dental caries, the first molar of the left lower jaw, amounting to 45 (41.7%) while the least affected by dental caries is the first molar of the right upper jaw with a total of 14 teeth (12.9%). The total number of permanent first molar dental caries in 8-year-old children is 108 teeth.

Table 4
Distribution of Permanent Molar Dental Caries in 9-Year-Old Children

Permanent first molar dental caries	n	%
Right RA	43	19.2
Left RA	48	20
Right RB	68	29.1
RB left	74	31.7
	233	100

Table 4 explains that at the age of 9 years who experience the most dental caries, namely the first molar tooth of the left lower jaw, amounting to 74 (31.7%) while the least affected by dental caries is the first molar tooth of the right upper jaw with a total of 43 teeth (19.2%). The total number of permanent first molar dental caries in 9-year-old children is 233 teeth

Table 5
Distribution of Permanent Molar Dental Caries in 10-Year-Old Children

Permanent first molar dental caries	n	%
Right RA	23	16.7
Left RA	16	13.4
Right RB	42	29.1
RB left	56	40.8
	137	100

Table 5 explains that at the age of 10 years those who experience the most dental caries, namely the first molar teeth of the left lower jaw, amounting to 56 (40.8%) while those who are least affected by dental caries are the first molar teeth of the left upper jaw with a total of 16 teeth (13.4%). The total number of permanent first molar dental caries in 10-year-old children is 137 teeth.

Table 6
Distribution of Research Frequency Based on Research Site

School Name		n	%
Elementary School 01 Robatal	Dental Caries	42	67
	No Dental Caries	21	33
02 Robatal Elementary School	Dental Caries	42	73.6
	No Dental Caries	15	26.4
Mi Nurut Tauhid	Dental Caries	41	66
	No Dental Caries	21	34
Mi Nurul Ulum	Dental Caries	37	68
	No Dental Caries	17	32

The results of the first permanent molar dental caries examination in children aged 8-10 years at the Robatal Health Center assisted elementary schools, namely Mi Nurut Tauhid, Mi Nurul Ulum, Elementary School 01 Robatal and Elementary School 02 Robatal had a sample of 236 children.

Table 7
Frequency Distribution Of Permanent First Molar Dental Caries In Children Aged 8-10 Years

Age	∑ M1 Permanen	∑ caries		∑ M1No caries	
		N	%	N	%
8 years	248	108	43.5	140	56.5
9 years	392	233	59.4	159	40.6
10 years	304	137	45	167	55

Table 6 and diagram 1 show the data on the results of the first permanent molar dental caries examination at the age of 8-10 years who experienced the most caries, namely at the age of 9 years with 233 teeth. Meanwhile, those who experience dental caries are few at the age of 8 years, which is 108 teeth. Data from 236 samples of research subjects had a total number of permanent first molar dental caries in children aged 8-10 years in elementary schools assisted by the Robatal Health Center, namely Mi Nurut Tauhid, Mi Nurul Ulum, Elementary School 01 Robatal and Elementary School 02 Robatal, dental caries that could be found in the first permanent molar teeth were 478 teeth (50.6%) and healthy teeth totaled 466 teeth (49.4%).

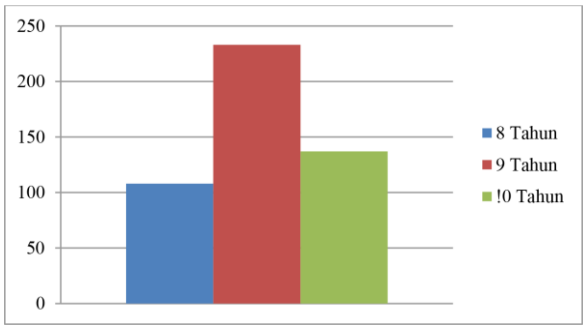

Diagram 1. Frequency Distribution Of Permanent First Molar Dental Caries In Children Aged 8-10 Years

Discussion

This study was conducted to determine the prevalence of permanent single molar dental caries in elementary schools assisted by the Robatal Health Center with a research sample of 236 children in the age range of 8 to 10 years. Based on the research conducted, it shows that the distribution of the most respondents is 127 women and 109 men. Children who had permanent single molar dental caries overall with a prevalence of 50.6%.

Dental caries is one of the dental and oral diseases that occurs mostly because teeth are not treated so that it has an impact on children's growth and development disorders. This is due to a lack of understanding in the maintenance of dental and oral health and the treatment of early caries. Factors that play a direct role in the caries process are dental plaque, microorganisms, and carbohydrate diet. Children aged 8-10 years are a group that is susceptible to dental and oral diseases because generally children at that age still have behaviors or habits that are not supportive of dental health This is in line with research conducted by Vineet Dhar and Maheep Bhatnagar (2009) where boys have more caries than girls. A higher prevalence of caries in boys can be linked.

Based on research by Talibo et al. (2016) shows that children aged 8-10 years often consume chocolate, candy, cakes and so on. These foods contain very high sugar so that food residues on the surface of the teeth are able to attach certain bacteria and make the condition of the mouth acidic. Repeated consumption of sugary foods and drinks will quickly lower the pH of the mouth to a level that can lead to demineralization with excessive eating habits compared to girls. Vineet Dhar and Maheep Bhatnagar (2009) email. Demineralization of enamel causes minerals in the teeth to disappear and enamel erosion occurs, making it easier for bacteria to enter and damage teeth until dental caries occurs. Caries does not destroy teeth in a matter of days or weeks, but rather months or years (Talibo, Mulyadi, & Bataha, 2016)

Permanent molar teeth are more susceptible to caries because of their morphological characteristics and functions as well as the misconception that molar teeth are equated with dendritic teeth that still have replacements if the teeth are damaged. The lack of public understanding that caries prevention can be done early also affects the high incidence of caries in children's teeth, even though by eating foods that contain high sugar levels and cleaning teeth regularly can reduce the risk of caries in children, so that the quality of life of children becomes higher (Rainbow, Pratibi, & Agustin, 2022).

In order for dental health maintenance behavior to be optimal, what needs to be done is to get used to brushing your teeth at least twice a day, namely first after breakfast and before going to bed at night. Second, you should brush your teeth immediately after consuming sweet and sticky foods. Third, choose a toothbrush that has soft bristles. Many people think that the harder you brush your teeth, the cleaner the results. The role of parents in preventing caries in school-age children is to carry out routine check-ups to dental health services so that when caries appears early, treatment (curative) can be carried out immediately. The influence of peers plays an important role in the child's attitude to visit the dentist, the child will be motivated and ask his parents to take him to the dentist, if he gets a story from his peers that the dentist is fun and not scary (Manton D, 2021) in (Prihatiningrum, Probosari, Dwiatmoko, & Wian, 2023)

Conclusion

Based on the results of the study on the prevalence of permanent first molar dental caries at the age of 8-10 years at the Robatal Health Center Assisted Elementary School with a sample of 236 children, it shows that the most people who experience caries are at the age of 9 years. Therefore, a dental and oral health education program is needed through the UKGS program that is continuous regarding the prevention and treatment of dental caries at elementary school age

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