

The Relationship Between Stunting And The Eruption Of First Permanent Molar In Children At Puskesmas 1 Ulu Palembang

Desi Fitriani^{1*}, Rosada Sintya Dwi², Tiara Tarasati³

^{1,2} Department of Pediatric Dentistry, Faculty of Medicine, Universitas Sriwijaya

³ Dentistry Study Program, Faculty of Medicine, Universitas Sriwijaya

*Correspondence author email: desifitriani64@gmail.com

Article info: Received : 20-3-2025 ; Revised : 22-4-2025 ; Accepted : 12-6-2025 ; Publish : 23-6-2025

Abstract : Background: Stunting is a risk factor that can cause dental development disorders, including tooth eruption. This study aims to determine the relationship between stunting and the eruption of the first permanent molar teeth in children in the working area of Puskesmas 1 Ulu. **Methods:** This was an analytical observational study using a cross-sectional approach in the service area of Puskesmas 1 Ulu Palembang. The study involved 33 children with stunting based on medical records from 2018 to 2021, who are currently aged 5–7 years in the service area of Puskesmas 1 Ulu. Analytical (infresial) analysis was conducted using the Chi-square statistic. **Results:** Among the 26 children (79%) classified as short stunting, 13 children had experienced the eruption of the first permanent molar tooth, while 13 children had not yet experienced the eruption of the first permanent molar tooth. Among the 7 children (21%) classified as very short stunting, 2 children had experienced the eruption of the first permanent molar tooth, while 5 children had not yet experienced the eruption of the first permanent molar tooth. The analysis results showed a p-value of 0.560 ($p > 0.05$). **Conclusion:** There was no significant association between stunting and the eruption of the first permanent molar tooth in children ($p = 0.560$) in the service area of Puskesmas 1 Ulu.

Keywords: Stunting, Tooth Eruption, Molar Tooth

INTRODUCTION

Indonesia has the third highest stunting rate in the South-East Asia/Southeast Asia (SEAR) region, according to the World Health Organization (WHO). In Indonesia, the average prevalence of stunting in children under five was 36.4% from 2005 to 2017. The 2022 Indonesia Nutrition Status (SGI) report shows that the stunting rate in South Sumatra is 18.6%, with 14.3% of children in Palembang City being stunted, 24.1% for boys and 25.2% for girls.¹ Stunting is a form of growth failure in the body and brain of children caused by long-term malnutrition or recurrent infections, resulting in children being shorter than their peers and experiencing delays in cognitive development.² Stunted growth occurs when children are shorter than their peers based on standard child growth measurements according to the WHO. This condition can affect brain development and

other body parts, including the oral cavity.³ Stunting is a risk factor that can lead to dental development disorders. Nutritional deficiencies, including energy-protein malnutrition, can disrupt tooth eruption, which can affect physical development.⁴

Tooth eruption is the movement of developing teeth from their non-functional position in the alveolar bone to their final functional position in the oral cavity (occlusal plane).⁵

Tooth eruption is influenced by various factors, including genetics, hormonal factors, gender, race, craniofacial morphology, nutrition, and height and weight.⁶ The first molar tooth is also known as the six-year molar because it is one of the permanent molar teeth that erupts first at the age of 6. The first molar tooth is the first permanent tooth to grow in the oral cavity and is a key component of occlusion.⁷

Stunting is a risk factor that can lead to dental development disorders. Nutritional deficiencies, including energy-protein malnutrition, can disrupt tooth development, which can affect physical development. A study by Lailasari et al. (2018) stated that there is a relationship between nutritional status and the number of erupted permanent teeth in children aged 6–7 years in Tanjung Sari, Sumedang Regency.⁸ A study by Zakiyah et. al (2017) states that there is an influence of nutritional status on the eruption of the first permanent molar in first-grade elementary school children in the Administrative City of Jember District.⁹ According to the Nutrition Surveillance Dissemination Book published by the Palembang City Health Department in 2019, Seberang Ulu I District is one of the districts with a high stunting rate in Palembang City.

Therefore, this study aims to determine the relationship between stunting and the eruption of the first permanent molar teeth in children in the Working Area of Puskesmas 1 Ulu.

METHODS

The type of research used in this study is analytical observational research with a cross-sectional approach. The research was conducted from 20 January to 10 February 2024. The research population consisted of children indicated as stunted based on data from 2018 to 2021 who are currently aged 5-7 years in the working area of Puskesmas 1 Ulu.

Based on the preliminary survey, the following information was obtained:

1. In 2018, there were 111 stunted infants
2. In 2019, there were 113 stunted infants
3. In 2020, there were 110 stunted infants
4. In 2021, there were 69 stunted infants

Secondary data collection was based on medical records from Puskesmas 1 Ulu to determine stunting status (short or very short). Sampling was conducted using purposive sampling.

The sample size required for the research purpose was calculated using the following formula:

$$n = \frac{z_{1-\alpha/2}^2 P (1 - P)}{d^2}$$

$z_{1-\alpha/2} = 1.96$ obtained from the standard normal distribution table with $\alpha: 5\%$

$P = 7.5\% = 0.075$ proportion of stunting in Palembang City (based on the Palembang City Health Office website)

$d = 10\% = 0.1$ (margin of error) set by the researcher

Based on the formula, the minimum sample size is 27 sample units to avoid dropouts. Therefore, the sample size was increased by 20% to a minimum of 33 sample units. The researchers conducted initial data collection on the research subjects, including age, date of birth, history of systemic and genetic diseases, and stunting status.

Research Tools and Materials

Tools:

1. Mouth mirror
2. Gloves
3. Hand sanitiser
4. Mask
5. Headlamp
6. Glass
7. Writing utensils
8. Nierbaken

Materials:

1. Water

2. 70% alcohol.

Data processing was performed using the SPSS programme. Data analysis was conducted analytically (infresial). Analytical (infresial) analysis was performed to determine the relationship between stunting and the eruption of the first molar teeth in children using the Chi-square statistic.

RESULTS

The results of a study conducted in the Working Area of Puskesmas 1 Ulu Palembang from 20 January to 10 February 2024 aimed to determine the pattern of eruption of the first permanent molar teeth in stunted children in the working area of Puskesmas 1 Ulu Palembang with 33 samples.

Table 1. Results of Chi Square Test Analysis of the Relationship between Stunting and Eruption of the First Permanent Molar Teeth in Children in the Working Area of Puskesmas 1 Ulu Palembang

<i>Stunting</i>	Erupted	Not Yet Erupted	Σ	<i>p- value</i>
Short	13	13	26	
Very Short	2	5	7	0,560

Analysis of the relationship between stunting and the eruption of the first molar teeth, using the chi-square correlation test. A probability approach with a significance level of $\alpha=0.05$ can be used to form the basis for decision-making.

To do this, the probability value is examined according to the following criteria:

a) If the $p\text{-value} < 0.05$, there is a relationship between the independent variable and the dependent variable.

b) If the $p\text{-value} > 0.05$, there is no relationship between the independent variable and the dependent variable.

Based on Table 1, it is known that of the 26 respondents in the short stunting category, 13 of children had experienced the eruption of their first molar teeth and 13 of children had not yet experienced the eruption of their first molar teeth. Of the 7 respondents in the very short stunting category, 2 of children had experienced the eruption

of their first molar teeth and 5 of children had not yet experienced the eruption of their first molar teeth.

Furthermore, the analysis results showed a p-value = 0.560 ($p > 0.05$), meaning that there was no significant relationship between stunting and the eruption of the first permanent molar teeth in children.

DISCUSSION

The results of the study conducted on stunted children in the working area of Puskesmas 1 Ulu Palembang showed that there was no significant relationship between stunting and the eruption of the first permanent molar teeth in children in the working area of Puskesmas 1 Ulu Palembang. These findings are consistent with the study by Fadilla et al., which showed no association between nutritional status and the eruption of the first permanent molar teeth in stunted children aged 6–7 years in the Jatinangor area ($r = 0.185$ and $p\text{-value} = 0.242$).¹³ This is also consistent with the study by Alnemer et al. which showed that height-for-age percentile (HAZ) and birth weight do not have a significant association with the number of teeth in the oral cavity.¹⁰ In this study, there was no significant association between stunting and the eruption of the first permanent molar tooth in children in the service area of Puskesmas 1 Ulu Palembang. The researchers assumed that other factors, such as socioeconomic factors, may influence this association.

Socioeconomic factors, including household income, maternal education, and access to healthcare services, significantly influence the risk of stunting in children across various countries.¹¹

This aligns with the study by Victora, Cesar G., et al., which showed a significant correlation between stunting and lower socioeconomic status (SES). Children from economically disadvantaged backgrounds are more likely to have a higher risk of stunting.¹²

This study was conducted in accordance with research procedures; however, there are several limitations in this study. The non-significant results in this study occurred because tooth eruption is influenced by many factors.

This study only assessed tooth eruption factors from a nutritional perspective, obtained from anthropometric measurements, namely children's height at a specific time

(cross-sectional), so the direct causal relationship between variables cannot be determined with certainty, and the strength of the relationship is unknown, meaning the data reflects the conditions at the time of the study. Other factors such as premature birth, socioeconomic status, and hormonal abnormalities were not measured, making it difficult to determine the most influential factor in the eruption of the first permanent molar teeth in stunted children.¹³

CONCLUSION AND RECOMMEN-DATIONS

The results of the study revealed that there was no significant relationship between stunting and the eruption of the first permanent molar teeth in children in the working area of Puskesmas 1 Ulu Palembang.

Based on the research findings, Puskesmas 1 Ulu Palembang can conduct education programmes for patients aimed at reducing or lowering the prevalence or incidence of stunting. This includes educating patients about the factors influencing stunting, preventive measures, and control strategies, as well as developing and implementing more effective stunting prevention programmes and increasing programme coverage. For research respondents, to improve knowledge, attitudes, and good behaviour regarding oral health and its abnormalities, as well as child health, respondents are encouraged to seek information from promotional media at the health centre and from media sources regarding factors that can cause abnormalities in molar tooth eruption and stunting. For future researchers, it is hoped that they can develop further research using a cohort method so that researchers can directly observe the factors influencing molar tooth eruption. Future researchers are encouraged to investigate the onset of delayed molar tooth eruption in stunted children. Future researchers are also encouraged to explore other factors not examined in this study that may influence molar tooth eruption in stunted children, such as premature birth, socioeconomic conditions, and hormonal abnormalities.

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