

NUTRITION STATUS CORRELATED TO THE FIRST PERMANENT MANDIBULAR MOLAR TEETH OF ELEMENTARY SCHOOL CHILDREN IN LINTAU BUO, TANAH DATAR REGENCY, WEST-SUMATRA

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ABSTRACT

The first permanent mandibular molar teeth is the most important for child, especially to stimulate growth of jaw. The teeth has normally erupted at children age of 6-7 years old. However, it is frequently not happened at this stage. This study aims to determine the nutritional status relate to the first permanent mandibular molars teeth eruption in the elementary school children age of 6-7 years old at Lintau Buo, Tanah Datar Regency, West-Sumatra Indonesia.

This is an analytical cross-sectional study, with anthropometric measurements of body mass index/BMI of elementary school children related to eruption of the first permanent mandibular teeth.

The results showed that nutritional status of elementary school children age of 6-7 years old for the most were within normal category (51.2%). Grade-I (6-7 years old) suffered from emaciation is still quite high (45.4%), 20.3% of 187 students who suffer from emaciation first permanent mandibular molars have erupted, the first permanent mandibular molars in first grade children (6-7 years old) with normal nutritional status, risk of overweight and obese have erupted.

Nutritional status affects children's first permanent mandibular molar erupted lower jaw. The better the nutritional status of a child then the eruption of the first mandibular molars will get better and grow in time.

Key words: nutritional status, tooth eruption, the first permanent mandibular molars, dental and oral health

INTRODUCTION

Indonesia health 2010 program has four health development mission, i.e. (1) drive the development of sound national health, (2) encourage people to live healthy self-reliance, (3) maintaining and improving health care quality, equitable and affordable; (4) maintain and improve the health of individuals, families and communities along their environment.¹ Quality of Human Resources (HR) is a key factor needed to implement national development. A factor that play a role in determining the quality of human resources is nutritional status of the community. With good nutrition will produce qualified human resources, healthy, smart, and has a strong physical and productive.²

Nutritional problems are public health issues that still need to be managed in an integrated manner by the various sectors, and this situation will affect the quality of human resources. Nutritional problems arise not only because it is influenced by an imbalance

of food intake, but also affected by infectious diseases. The prevalence of malnutrition among school-age children reached 36.1%. If the proportion of children aged 5-9 years was 10% of the total population, there are more than 7 million children aged 5-9 years with malnutritional status.² Elementary school children are the easiest group suffered health problems due to malnutrition.

Based on the investigation ever undertaken against elementary school children in both urban and rural areas in Indonesia, found the fact that in general, weight and height the average elementary school child is under the normal size. Not infrequently in children is found signs of nutritional disorders, whether in the form of light, or heavy. Elementary School pupils nutrient levels in various regions in Indonesia, especially in poorer areas and isolated by the Ministry of Health survey, nearly 50% of elementary school students classified as malnourishment.³

A good nutritional status of communities is one critical success factor of national development. Therefore, to obtain an optimal program impact, community nutrition improvement efforts based on

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the human life cycle approach, for example since the fetus in the womb, babies, school age, teens, adults and elderly⁴. Poor nutritional status affect the quality of human resources, because the nutritional status can affect intelligence, resistance to disease, infant mortality, maternal mortality, and labor productivity.

Nutritional status is influenced by food intake. Good or optimal nutritional status occurs when the body gets enough nutrients are used efficiently, thus allowing the physical growth, brain development, work ability and general health at the highest possible level. Malnutrition status occurs when the body has a deficiency of one or more essential nutrients. Nutritional status occurs when the body gets more nutrients in excessive amounts, leading to toxic effects or more dangerous.⁵ Nutrition is also very essential for healthy teeth and mouth. Nutrition is an important factor for the growth and development of the teeth. In the early stages of tooth growth process is influenced by a number of factors and elements such as growth Ca, P, F, and vitamins in the diet. Child nutrition is needed especially in times of growth. A good diet is a diet that contains all the elements necessary for the growth of the teeth, namely carbohydrates, proteins, fats, vitamins, and minerals in sufficient quantities and appropriate. Teeth are not formed properly can cause a variety of disorders of the teeth.⁶

The first permanent teeth eruption is the first molars appear between 6-7 years. Permanent first molars second molars grow in addition to milk, so there is no interference at the time of eruption. The first permanent molar teeth is a very important and is called the "Keystones of Dental Arch" which means that the shape of the mouth of a child depends on the size of teeth.⁷ The first permanent molar teeth is the largest among the teeth after the eruption of new milk and enough jaw growth, so there is room to appear on mouth cavity.⁸ Teeth molar The first remain must treated as possible, because besides do not exist instead, is also an teeth who important for the stimulate the growth of jaw.⁹

According to Sri, nutritional deficiencies can lead to delays in the process of teeth eruption. Boenjamin et.al,⁹ stated that, in Jakarta showed no association between nutritional status with the first permanent molar eruption below. The first permanent molar teeth is most important for every child, especially to stimulate jaw growth. Normally the first permanent molars have erupted at the age of 6-7 years, whereas in fact there are still unerupted at that age.

District of Buo Lintau located in Tanah Datar regency, with the number of elementary schools, there are 34 elementary schools spread out all. The results of preliminary studies have been conducted in elementary schools in the district Lintau Buo, data showed the number of elementary school pupils as many as 5.708 people. Of them, 412 were aged 6-7 years, consisting of 208 men and 204 of women. Initial

observations have been carried out on 10 students, there are 4 students who first permanent molars have erupted underneath. Therefore, researchers interested in studying the relationship between nutritional status with first molar eruption of permanent teeth in children under 6-7 years of elementary school age in District of Lintau Buo Tanah Datar regency. The purpose of this study was to know relationship between the nutritional status of the permanent first molar teeth eruption under the age of 6-7 years of elementary school students.

MATERIALS AND METHODS

This research applying an analytical cross sectional study and measurements were performed to determine the relationship between the effects of risk factors. The research was conducted by collecting data at some point on nutritional status and the eruption of permanent first molar teeth down.

The population of this study was all elementary school children aged of 6-7 years in the Lintau Buo District. Sample in this study were elementary school pupils aged 6-7 years in district of Lintau Buo uses total sampling method and sampling criteria inclusion in the subjects who did not have the disease because it can affect the specificity and sensitivity of anthropometric measurements.

Nutritional status of data collection is obtained by performing measurements of weight and height of the subject and the results are recorded on the examination format. Body weight was measured using standard scales, namely, the subjects were told to remove footwear before measured. Height measurement is done by: a) Asks respondents releasing footwear (sandals/shoes), hat (head covering), b) Ensure the tool slide at the top position, c). Respondents were asked to stand upright, just below the slide tool, d) The position of the head and shoulders back, arms, buttocks, and heels, stick to the wall where microtoise posted, e) The view straight ahead, and hands-free in a dependent position, f) The tool slide is moved until it touches the top of the head of the respondents, and make sure the tool slide is right in the middle of the head of the respondents. In these circumstances the back of the tool should slide right against the wall, g) The figure height is read on the read window towards larger numbers (down), reading directly in front of number (scale), the red line, parallel to the eyes of the officer, h) Rate measurements are recorded on the forms provided, and compared with standard tables HARVARD, and noted criteria nutrition status.⁶ Researchers calculate the nutritional status based on Body Mass Index (BMI).

Data obtained from the test results were analyzed by bivariate correlation "r" of Pearson Product Moment and Linear regression with 95% confidence ($\alpha < 0.05$) to determine the correlation between nutritional status with the eruption of

permanent first molars in the mandible Elementary School pupils 6-7 years of age.

RESULTS

Research of correlation between nutrition status to first permanent molar eruption at District of Lintau Buo was carried out on 8 September to 8 October 2011. Characteristic of 412 students recruited in this study were depicted in Table 1.

Table 1
 Characteristic of Elementary School Students

Characteristic	Frequency	
	n	%
Sexes		
Girl	204	49.5
Boy	208	50.5
Age (years)		
6.0-6.9	35	8.6
7.0	27	6.6
7.1-7.8	350	84.9
Nutritional status		
Thin		
Girl	86	20.8
Boy	101	24.6
Normal		
Girl	114	27.7
Boy	97	23.5
Fat risk		
Girl	2	0.5
Boy	4	1.0
Fat		
Girl	2	0.5
Boy	6	1.4

Data correlation of first permanent molar teeth eruption of elementary school student ages of 6-8 years in Lintau Buo District in the year of 2011 can be seen in Table 2.

Table 2
 Correlation of Nutritional Status to Teeth Eruption

Nutritional Status	Teeth Eruption			
	Not erupted		Erupted	
	n	%	n	%
Thin	38	20,3	149	79,7
Normal	14	6,6	197	93,4
Fat Risk	0	0	6	100
Fat	0	0	8	100

DISCUSSION

Data obtained from the study were analyzed with a statistical test "r" of Pearson Product Moment and Linear regression with 95% confidence ($\alpha < 0.05$) to determine the correlation between nutritional status

with the eruption of permanent first molars in the jaw under the age of elementary school pupils 6-7 years in district of Lintau Buo. The analysis of data obtained show the value of $r = 0.389$ there is a relationship between nutritional status with the eruption of permanent first molars mandibular first grade pupils in elementary schools in District of Lintau Buo.

Value of $R^2 = 0.151$ gives a donation to the eruption of the nutritional status of the first permanent molar teeth lower jaw that is equal to 15.1%, while 84.9% were contributed by other factors. Regression line equation $Y = 1.701 + 0.108 * X$ with p-value = 0.000 < 0.05, which means there is a significant and positive pattern between the nutritional status of the eruption of permanent first molars in the mandible Elementary School pupils aged 6-7 years in the District of Lintau Buo Tanah Datar Regency.

Nutritional status of elementary school pupils aged 6-7 years in district of Lintau Buo showed that 51.2% were in the normal category, but 45, 4% is still a category of nutritional status on thin, this figure is still quite high, based on the MDGs there are no more elementary school children who suffer from nutritional thin. This situation is directly one of them caused by poor food consumption. While not a direct cause of the dominant economic level includes the less, public education and nutrition education is lacking. District of Lintau Buo is one district in Tanah Datar regency, located on the slopes of Mount Sago, livelihoods in the district at large peasants Lintau Buo. The natives who live in this area most of the educational background medium. In the District Lintau Buo have 2 unit of Health Services Centre (PHC) which is located in the central districts. Health services in this area is still not evenly distributed because there are still villages so remote that is very difficult to reach and difficult transportation. This results in limited circumstances all the information and services particularly in health, so that the area that have limited knowledge about nutrition. Level of parents who lack knowledge about health, especially about family nutrition nutrition causes not specifically for children in infancy. According Schuurs¹⁰ factors affecting nutritional status include food intake, food availability, knowledge and health services. While Moehji³, stated socio-economic status of consumption of food affects the ability of households to produce and / or buy food, to determine the practice of feeding infants, toddlers, health and environmental sanitation.

Nutritional improvement of children still need to be improved, such as by implementing nutritional status monitoring, supplementary feeding, full feeding, worming administration, counseling and education skills, because malnutrition can affect a person's growth and development primarily in children who are in its infancy, including the growth of teeth, especially the first molar teeth remains below

and can affect children's intelligence. According Almatier,⁵ general malnutrition can cause interference with the process of growth, energy production, the body's defenses, the structure and function of brain and behavior.

Enterprise and Maulani¹¹ stated that the first molar tooth remains below will appear in the oral cavity from children aged 6 years, and the normal limits of the first molar teeth eruption remains below that at the age of 6-7 years. The statement is in accordance with the results of a study of 412 first grade elementary school pupils aged around 6-7 years in the District of Lintau Buo showing that 87.4% of students with first permanent molars had erupted lower jaw. This means that in general children aged 6-7 years remained lower first molars have erupted, and only 12.6% that have not erupted. Many factors can cause delays teeth eruption in particular under the first molar teeth. The opinions expressed by Schuurs et.al¹⁰, that teeth eruption is influenced by several factors: nutritional, hormonal, hereditary or genetic factors.

20.3% of students from 187 students who suffer from emaciation at the District of Lintau Buo first mandibular molar tooth unerupted permanent, while the first permanent molars have erupted mandibular mostly found in children with normal nutritional status, risk of overweight and obese. The biological results showed that the nutritional status of children affects the growth of permanent mandibular molars. Statistically proven the value of $p = 0.000 < 0.05$ that there is a significant association between nutritional status with the eruption of permanent first molars in the mandible Elementary School pupils aged 6-7 years in the district of Lintau Buo. This means that the better a person's nutritional status, the better the growth of the first permanent molar teeth lower jaw and vice versa. This result suggests that nutritional deficiencies can lead to delays in the process of tooth eruption. These results are consistent with the results of research conducted by Boenjamin et al. the FKG USU⁹, in Jakarta, which showed no association between nutritional status with the eruption of permanent first molar teeth down.

Nutrition in general to the growing body of work including teeth and jaw growth, which will affect the eruption of teeth. Nutritional deficiencies in children are carbohydrates, proteins, fats, vitamins and minerals will lead to disturbances in growth, dentition and jaw as well, this will cause interference with the eruption of the teeth so the teeth delayed eruption of his time. The first permanent molar teeth under the teeth are important for every child, and should be treated as possible, but there is no return, is also an important gear to stimulate jaw growth. The first molar teeth occlusion is the key to the growth, development and health is important to note. According Schuurs et.al,¹⁰ severe malnutrition affects

the growth and development of the body, which is determined by the length and weight, these circumstances there is a connection with the delayed appearance of the teeth and the hypoplastic.

Teeth is a small part of the bone, the formation is initiated from within the womb. Teeth grow and develop in line with the growth and development of other bodies, as well as the body's growth and dental development requires adequate nutrition for growth can be run well and grow according to the time of growth. According Sediaoetama¹², nutrition is one important factor for the growth of the teeth, which will affect the eruption of permanent teeth. According Supartinah¹³ essential amino acid intake in the diet for a young age to work for the growth and development of tissues, including tissues and dental manifestations of protein calorie deficiency (CTF) at the mouth causing teeth eruption was delayed, whereas the biological function of vitamin A may help bone growth and development primarily as the precursor cells of osteoblasts and osteoclasts. Nutrients that most influence on the growth and development of teeth and bones is calcium that is 99% and only 1% for soft tissue. Various kinds of nutrients plays an important role in the formation and growth of the teeth, which took place in the womb until maturation of the teeth so it can function in the oral cavity, whether the milk teeth and permanent teeth. Therefore necessary efforts to improve the nutritional status of children in infancy, especially the growth of the teeth in order to obtain an optimal state of oral hygiene including tooth eruption of the first permanent molar. These efforts can be achieved with the good cooperation between governments, health workers, teachers and parents.

CONCLUSION

Based on the results of the study and description of the discussion the following conclusions can be drawn: Nutritional status of elementary school children aged 6-7 years most of the normal category (51.2%). Grade I (aged 6-7 years) who suffered from emaciation is still quite high (45.4%). 20.3% of the 197 students who suffered from emaciation first permanent molars. Lower jaw teeth has not been fixed mandibular first molar at the first year students (ages 6-7 years) with normal nutritional status, risk of overweight and obese have eruted. Nutritional status affects a person's first permanent molar teeth eruption mandible. The better a child's nutritional status is the first permanent molars erupt lower jaw will get better and grow in time

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