

Relationship Pattern Of Formula Milk Using A Milk Bottle To The Risk Of Dental Caries In Children Aged 3-6 Years In Bontorannu Village Bulukumba Regency

Nurnainah^{1*}, Asneni Palembang², Sri Wahyuni Bahrum³, Suciani⁴, Andryana Agrevita⁵

^{1,2,3} Lecturer of Bechalar health nursing, STIKES Gunung Sari Makassar, Indonesia

⁴ Bechalar of health nursing, STIKES Gunung Sari Makassar, Indonesia

⁵ Lecturer of Bechalar health nursing, Universitas Islam Negeri, Indonesia

* Corresponding author:

E-mail : inacloud3158@gmail.com

Abstract

WHO's data in 2017 shows that 60-90% of children's in industrilized countries experience dental caries. Whereas in Indonesia, especially in South Sulawesi, based on a survey conducted by the Hasanuddin University Faculty of Dental Health in 2019 showed that children's suffering from dental caries reached up to 90.05%. The purpose of this research is to determine the relationship between the pattern of formula milk using milk bottles against the risk of dental caries in children. Type of the research is quantitative study with an observational method using a cross sectional approach. Population in this study were all children's aged 3-6 years in Bontorannu Village, Bulukumba Regency who consumed formula milk using a milk bottle, as many 38 children's. Sampling was done by nonprobability sampling with a total sampling technique. Research result shows that children who consume formula milk using milk bottles correctly as many 13 (34.2%) isn't risk suffering of dental caries, and wrong as many 25 (65.8%) is risk suffering dental caries. The results of data analysis using the chi-square test obtained p value=0.000 (0.05), H_0 is rejected or there is a significant relationship between the pattern of formula milk using milk bottles and risk dental caries in children's.

Keywords : Caries, Formula Milk, Milk Bottle

I. INTRODUCTION

Dental caries is one of the most frequent and most common dental and oral health problems in the community and can effect all ages, both toddlers and adults. Data from WHO in 2017 shows that 60-90% of children in industrialized countries experience dental caries. Whereas in Indonesia itself, especially in South Sulawesi, based on a survey conducted by FKG UNHAS in 2019 it showed that children suffering from dental caries reached up to 90,05%.Dental caries in children can cause pain, untimely loss of teeth, dangerous infections and even affect the growth of adult teeth (permanent teeth) in children. Even according to WHO (world Health Organization), dental caries can affect the quality of life of children. Child growth will be hampered because dental caries will make it difficult fot children to eat and sleep.

Consuming milk using a milk bottle can cause milk to flood the oral cavity within a few hours the puddle of milk will became a substrate fermented by bacteria to become acidic and reduce the plaque pH, which can cause dental caries.Lombo's research (2015) shows that 79% of children at Citra Kasih School Manado who suffer from caries are a group of children who consume formula milk more than 2 years, 3 times a day, and more than 15 minutes. Research Ghaitsaet al. (2017) shows that the index caries in children who consume bottle formula is 5.3 and is in the high category, while the caries index of children who consume milk without using bottles is in the moderate category, which is 3.4.Based on this phenomom, researchers are interested in conducting research on the relationship between the pattern of formula milk using a milk bottle against the risk of dental caries in preschool children.

II. METHODS

The type of research used is quantitative research with observational methods using a cross sectional approach. The population in this study were all children aged 3-6 years who consumed formula milk using milk bottles, as many as 38 children. Sampling was using nonprobability sampling with total sampling technique. Conducted in the village of Bontorannu, Kajang, Bulukumba regency in September 2020.Data

collection was carried out using a questionnaire and conducting a dental examination. The Dependent variable in this study is dental caries and independent variable is pattern of consumption of formula milk which included duration, time, frequency and duration of consumption of formula milk and use of bottle in the consumption of formula milk. The analysis used was univariate and bivariate analysis. The hypothesis test used is the Chi-Square test.

III. RESULT

The gender distribution of preschool children in Bontorannu village who become respondents was 19 (50%) girls and 19 (50%) boys. Based on age, it is known that there are 7 (18.4%) children aged 3 years, 10 (26.3%) children aged 4 years, 13 (34.2%) children aged 5 years, and the age of 6 years as many as 8 (21.1%) children. The result of the examination conducted in Bontorannu village showed that 26 (68.4%) children suffered from dental caries and 12 (31.6%) children were not at risk of suffering from dental caries. The results of data analysis using the chi-square test obtained p value=0.000 (0.05), H_0 is rejected or there is a significant relationship between the pattern of formula milk using milk bottles and risk dental caries in children's.

Table 1. distribution of consumption period of formula milk

Consumption Period	n	%
2-3 years	14	36,8
>3 years	24	63,2
Total	38	100

Table 1. shows that there are 14 (36.8%) children who consumed formula milk for 2-3 years, and children who consume formula milk for >3 years are 24 (63.2%) children.

Table 2. distribution of consuming time formula milk

Consuming Time	n	%
morning	2	5,3
noon	1	2,6
night	5	13,2
sleep time	30	78,9
Total	38	100

Table 2. shows as many as 2 (5,3%) children consume milk in the morning, during the day as many as 1 (2.6%) children, at night as many as 5 (13.2%) children, and during sleep as many as 30 (78.9%) children.

Table 3. distribution of consumption frequency of formula milk

Consumption Frequency	n	%
2-3 times	3	7,9
4-5 times	28	73,7
>5 times	7	18,4
Total	38	100

Table 3. shows that 3 (7.9%) children consumed formula milk 2-3 times a day, 4-5 times a day as many as 28 (73.7%) children, and >5 times a day as many as 7 (18.4%) children.

Table 4. distribution of consumption duration of formula milk

Consumption Duration	n	%
1-5 minute	4	10,5
5-10 minute	5	13,2
>15 minute	29	76,3
Total	38	100

Table 4. shows that duration of consumption of formula milk for 1-5 minutes is 4 (10.5%) children, 5-10 minute for 5 (13.2%) children, and >15 minute as many as 29 (76.3%) children.

Table 5. distribution of using a milk bottle in the formula milk consumption

Use of Milk Bottle	n	%
Right	13	34,2
Wrong	25	65,8
Total	38	100

Table 5. shows that the use of milk bottle in the consumption of formula milk in the right way as many as 13 (34.2%) children, and as many as 25 (65.8%) children in the wrong way.

IV. DISCUSSION

A. Consumption Period of Formula Milk Against the Risk of Dental Caries in Children

In this study, it was found that 9 (23.7%) children who consumed formula milk using a milk bottle for 2-3 years were not at risk of dental caries. This is influenced by the role of parents in preventing caries after the children consumes milk. And as many as 5 (13.2%) children are at risk of suffering from dental caries because of the lack of caries prevention measures taken by parents. Meanwhile at >3 years of consumption, it was found that 3 (7.9%) children were not at risk of suffering from dental caries. Similar to children who consume milk for 2-3 years, parents play a very important role in getting children to do caries prevention after consuming milk using a bottle. And 21 (55.2%) children are at risk of experiencing dental caries because in addition to the lack of precautions such as rinsing water and brushing their teeth after consuming milk, it is also associated with time, frequency, duration and inappropriate bottle use in feeding.

According to Heriandi (2017), giving formula milk for a long period of time, the use of milk bottles, the frequency and duration of consumption of formula milk are the causes of dental caries in children. The longer the tooth surface is in contact with carbohydrates, the greater the possibility of acid production in the oral cavity. The research is in line with the result of research conducted by Jingga et al. (2019) at Diponegoro Islamic Kindergarten in Semarang City. Where after doing research on the length of consumption of formula milk, the result showed that (51.6%) children suffering from dental caries were children who consumed formula milk for 2-3 years. So, the research assumed that there was a relationship between the length of time consuming formula milk and the risk of dental caries in children. This is also influenced by the punctuality, frequency, and duration of excessive children's milk consumption and the attitude and role of parents who do not get children to drink water and brush their teeth regularly after consuming formula milk from a milk bottle.

B. Consuming Time of Formula Milk Against the Risk of Dental Caries in Children

This study shows that children who consume formula milk using milk bottles in the morning are not at risk of experiencing dental caries as much as 2 children (5.3%) and during the day there is no risk of experiencing dental caries as much as 1 children (2.6%). This happens because if in the morning and afternoon the teeth are not long soaked in milk and the child can drink mineral water when thirsty at another time. In addition, parents also have plenty of time to encourage their children to brush their teeth. When the night consumption was not at risk of experiencing dental caries as much as 3 children (7.9%). Because even though it is night, children still have time to clean their teeth before going to bed. Children who are used to brushing their teeth before going to bed from an early age have healthy teeth. And those who experienced dental caries were 2 children (5.3%). This is because children spend more time watching TV while lying down and drinking milk. This is also influenced by the attitude of parents who get children to consume milk while lying down and do not get children to brush their teeth before bed. At the time of sleep consumption, 24 children (63.2%) had dental caries. At night, children will usually whine even though they are asleep. And some parents usually give milk using a milk bottle to soothe their children. Children no longer have time to clean their teeth because they are already asleep.

This will cause the milk to stay in the mouth longer and interact longer with the tooth surface. And as many as 6 children (15.8%) are not at risk of experiencing dental caries because even though they are given milk a sedative, some parents will make the child up to gargle water or replace milk with plain water after the child returns to calm and sleeps. According to Wijayanti (2015), teeth take about 3 hours to recover from each cariogenic exposure. Bacteria and the substrate take a long time to demineralize and progress to caries. Consuming milk using a bottle while sleeping will cause the liquid milk to pool in the oral cavity and teeth for several hours and stimulate fermentation which can cause caries. This is in line with the research conducted by Jingga, et al. (2019) at Diponegoro Islamic Kindergarten, Semarang City, where after a study on the time to consume formula milk in children, it was found that (86%) children consumed milk while sleeping and suffered from dental caries.

Researchers assume that consuming milk from a bottle at bedtime will cause the milk to stagnate in the mouth and cause fermentation which will certainly accelerate tooth decay. Most of the parents in Bontorannu village use milk as a sedative for their children when the child whines in between sleep and no longer has the opportunity to invite the child to drink water and brush their teeth.

C. Consumption frequency of Formula Milk Against the Risk of Dental Caries in Children

This study showed that 3 children (7.9%) had no risk of consuming formula milk using milk bottle 2-3 times a day and were not at risk of developing dental caries. The normal dose of formula milk consumption for children aged 3-6 years is 2-3 times a day and does not have the potential to damage teeth. 19 (50%) children who consume milk 4-5 times a day are at risk of suffering from dental caries. Children who consume milk 4-5 times a day are included in the category of frequent and exceed the normal limit of frequency of milk consumption for children 3-6 years. Repeated contact with dental and dental plaque over a period of 30 minutes exposes the tooth to an acidic environment for a long time and increases the risk of developing dental caries. And 9 children (23.7%) are not at risk of dental caries because of parents who accustom children to not drinking milk while lying down and taking the time to drink water in between milk consumption. In the consumption of milk more than 5 times a day and in the very old category, 7 children (18.4%) had dental caries.

Likewise, children who consume milk as much as 4-5 times, which causes teeth to be exposed to milk liquid are more often accompanied by a lack of precautions by parents. The higher frequency of children's milk consumption, the higher potential for children to experience dental caries. According to Sulistyoningih (2015), consuming too often carbohydrate foods and drinks will cause the oral cavity to always be in an acidic condition and tooth enamel does not have the opportunity to remineralize completely which of course will cause dental caries. This is in line with the result of Ani's (2016) research conducted in Pabelan village. After doing the research, it was found that (93%) children who suffered from dental caries were those who consumed formula milk using milk bottles more than 3 times a day. Researchers assume that there is a relationship between the frequency of consumption of formula milk and the risk of dental caries in children. The higher frequency of the child consuming bottle milk, the more often the carbohydrate substrate (such as sugar and glucose sucrose) is fermented by bacteria and then produces acids which will cause a decrease in the pH of saliva and formation of plaque. This can be prevented by getting children to drink water and brush their teeth after drinking milk.

D. Consumption duration of Formula Milk Against the Risk of Dental Caries in Children

This study shows that there are 4 (10.5%) children who consume formula milk using milk bottle for 1-5 minutes and are not at risk of experiencing dental caries. New acids will be produced by bacteria after sugar intake lasts for 20-40 minutes in the oral cavity. Duration 5-10 minutes indicated that 1 child (2.6%) had dental caries, because although the duration was not very long, it was accompanied by a very frequent frequency so that the child's teeth did not have the opportunity to remineralize completely. And there are 4 (10.5%) children who are not at risk of experiencing dental caries. In this duration, children who are not at risk of suffering from dental caries are more dominant. This happens because there is still a lack of time required for the acid to be fermented by bacteria accompanied by an excessive frequency of consumption. At duration of >15 minutes, there are 25 (65.8%) children experiencing dental caries. This occurs because teeth that are exposed to an acidic environment for a long time will cause the teeth to remineralize and eventually lead to dental caries. And 4 (10.5%) children were not at risk for dental caries. Although the duration is quite long, because it is accompanied by other precautions such as reducing the frequency, timing of giving and using the right milk bottles so that the risk of dental caries can be minimized.

According to Wijayanti (2015), the main cause of dental caries is related to the length of time the teeth are exposed to sugar so it is very important to consider the cariogenicity of a food and drink and how long it takes to consume that food or drink. This is in accordance with the opinion of Jingga, et al. (2019) conducted at Diponegoro Islamic Kindergarten in Semarang City. Where after doing research on the duration of consumption formula milk, the results showed that (96.9%) children suffering from dental caries is children who consumed formula milk for >15 minutes. Researchers assume that there is a relationship

between the duration of consumption formula milk and the risk of dental caries in children. This is because the acid produced in the oral cavity after drinking milk lasts for 20 to 40 minutes. Coupled with the frequency of consumption that is very frequent and the timing of giving and using milk bottles is wrong. The longer the child's teeth are exposed to milk, the higher the child's potential to suffer from dental caries.

E. The Use of Milk Bottle Against the Risk of Dental Caries in Children

This study shows that the wrong use of milk bottles in the consumption of formula milk, there are 25 (65.8%) children experiencing dental caries. When a child drinks milk using a milk bottle while sleeping, the milk liquid will wet all the teeth in the upper jaw except for the lower front teeth because the bottle nipple is located against the roof of the mouth. This causes the substrate to be fermented by bacteria and produce acid. Correct use of milk bottles indicated 1 (2.6%) had dental caries. Even though the attitude of using milk bottles is correct, it is accompanied by inappropriate consumption patterns of formula milk that also has the potential to cause dental caries. And there are 12 (31.6%) children who are not at risk of experiencing dental caries. The use of the correct milk bottle accompanied by the correct formula milk pattern certainly does not cause damage to the child's teeth.

According to Permatasi (2015) who says that feeding using a bottle before even when the child sleeps can reduce the amount of salivary flow and thicken so that the salivary cleansing effect is reduced and will increase the quality of cariogenic bacteria which will certainly cause dental caries. This is in line with Elfi & Andriani's (2018) research conducted at TK Gampong Lambaro Aceh Besar. Where after doing research on the use of milk bottles, it was found that (95.4%) children suffering from dental caries were children who consumed milk using a milk bottle in a bad way. Researchers assumed that there was a relationship between the use of milk bottles and the risk of dental caries in children. Formula milk given to children using milk bottle can be a cause of dental caries. Using a milk bottle until or while sleeping is not a good way because it can cause the oral cavity to be flooded with milk liquid within a few hours so that the substrate will ferment by bacteria and produce acid and lower the pH of plaque. The longer and more often the child consumes milk using a bottle, the higher the potential for dental caries. This is also influenced by the lack of parental knowledge about how to properly feed formula milk and prevent caries when feeding using bottles. So that children do not rinse, rinse with plain water, and don't brush their teeth after consuming milk using a milk bottle.

V. CONCLUSIONS

In this study, there is a relationship between the length, time, frequency and duration of consumption of formula milk using a milk bottle against the risk of dental caries in preschool children. The longer and more often the child consumes milk, the greater the risk for the child to suffer from dental caries. The use of milk bottles in formula milk at bedtime is very bad for children's dental health. It should be suggested to parents to broaden their knowledge regarding children's oral and dental health, especially in terms of giving formula milk using milk bottles so that preventive measures for dental caries in children can also be done properly and as early as possible.

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