

## Eating Pattern and Oral Hygiene during Covid-19 in Preschool Children

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### Abstract

The Covid-19 pandemic has caused significant changes to the daily routines of people globally, especially modifications among preschoolers, such as changes in food intake and maintaining oral hygiene. That can be related to the parents' method to assist their children at home during the Covid-19 pandemic accompanied by the temporary suspension of Early Childhood Education (PAUD) activity that raises concerns for educators. The research objective is to describe the frequency of children's eating patterns of cariogenic foods, parental attitudes and parental knowledge of children's oral hygiene, and behavior in maintaining oral hygiene during the Covid-19 pandemic in preschool children.

This type of research is descriptive-quantitative with a cross-sectional research design. The sample is 56 people using the total sampling technique. The research instrument used were the Food Frequency Questionnaire, oral hygiene attitude and knowledge questionnaire, and behavior questionnaire to maintain oral hygiene.

The highest percentage of cariogenic food diets were bread (64.29%), chocolate (50.00%), and snacks (48.21%). Parents predominantly have good attitudes and knowledge about their children's oral hygiene (98.21%), and the frequency distribution of children's behavior in maintaining oral hygiene through brushing teeth activities shows the highest percentage in terms of brushing teeth using a soft-bristled toothbrush and using toothpaste each as many as 46 people (82.14%) respectively.

During the Covid-19 pandemic, the highest cariogenic foods consumed included bread, chocolate, and snacks. Parents mostly have good attitudes and knowledge about their children's oral hygiene, but children's behavior in maintaining dental and oral hygiene through brushing teeth still needs to be enhanced in terms of frequency, time, equipment utilization, and techniques.

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### Introduction

Coronavirus disease-19 (Covid-19) pandemic has caused drastic changes in the daily routine and lifestyles of the community globally since the implementation of some restrictions including the school's temporary suspension<sup>1,2</sup>. These conditions then impact the behavior and habits of preschoolers during the replacement of Early Childhood Education (PAUD) to learning at home<sup>3</sup>. These sudden changes can cause increased sensitivity,

tantrums, spoiling, and behavioral disorders due to stress and boredom<sup>4</sup>. Furthermore, the parents find strategies to persuade children by giving their favorite foods that cause an increase in food intake and choices of unhealthy food, accompanied by improper dental and oral health habits<sup>1,3</sup>.

A study conducted in Italy showed an increase in consumption of sweet foods during the lockdown by 51.4% in children and adolescents aged 4-14 years<sup>5</sup>. Based on Damla's research, 65% of 1,013 children in India reported not brushing their teeth at least twice a day during the Covid-19 pandemic in 2021<sup>6</sup>. The survey conducted in China during the lockdown on preschool-aged children provides insight into the impact of Covid-19 on oral health status, attitudes, and behaviors. The reported caries prevalence shows that 60.8% of 4495 children

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and more than 30% of children suffer from toothache, with unavailable dental health services<sup>7</sup>.

Various limitations in the field of education raise concerns for teachers as educators because the child's habits are entirely the responsibility of the parents. One of them is preschool children in Kober Baitul Ulum whose majority of parents have relatively low levels of education and economics, so this is related to the obstacles experienced in the development of children's behavior and habits, especially in the context of maintaining oral hygiene. This study aims to describe the frequency of children's eating patterns in terms of cariogenic foods, parental attitudes and parental knowledge about their children's oral hygiene, and behavior to maintain oral hygiene during the Covid-19 pandemic in preschool-age children.

### Materials and methods

The research design is a quantitative study through reporting cariogenic diet frequency and oral hygiene during Covid-19. This type of research is descriptive research with a cross-sectional design. Take place in Kober Baitul Ulum Cianjur, with an implementation time of 2 months, namely in March-April 2022. The study population was at the age of preschoolers in Kober Baitul Ulum Cianjur, collecting 56 people in the 2021/2022 academic year. Samples were determined using a census or total sampling.

The diet in this study is the frequency of cariogenic foods consumed by preschoolers in Kober Baitul Ulum Cianjur per day during the Covid-19 pandemic, such as the consumption of 5 foods, namely bread, cakes, sweets, chocolate, and snacks known through the Food Frequency Questionnaire (FFQ). Indicators of oral hygiene assessed were 31 questions regarding the attitude and knowledge of parents and ten questions regarding the behavior of preschool-aged children in maintaining oral and dental hygiene that are adapted from previous studies that have been through the face validity<sup>8,9</sup>. The category for calculating the attitudes and knowledge of oral hygiene questionnaires uses the median formula, categorized Good (if the correct answer is 16 and Less (if the correct answer is <16). Behavioral indicators with the per-item analysis method and performed in the form of a frequency distribution. The frequency

chosen if the behavior is carried out between 5-7 days a week, the occasional category if the behavior is in 3-4 days a week, and the seldom option chosen if the behavior is carried out between 1-2 days a week, and the no-nonsense category if the child does not have performed the stated behavior. Data has been collected, edited, entered, cleaned, and analyzed univariately using a Microsoft Excel spreadsheet. Ethics approval letter number 250/UN6.KEP/EC/2022.

### Results

The characteristic of preschool children participated based on their gender mostly females consisting of 31 people (44,64%) with a total of 56 children. Participated by children aged 4 (1,79%), 22 children aged aged 5 (39.29%), and 33 children aged 6 (58.93%). The respondents were 46 mothers (82.14%) while another 10 (17.86%) were fathers. Characteristics of parents of preschool-age children based on education level shows the highest number that is SMA/equivalent, 24 people. Characteristics of parents of preschool-age children based on occupation, mostly parents who are housewives as many as 36 people.

The results of the study on the eating patterns of preschool-aged children in Kober Baitul Ulum, Cianjur shows the three cariogenic type eating pattern with the highest frequency chosen, namely the pattern of eating bread which is consumed once a day with a total of 36 children (64.29%), 28 children consumed chocolate once a day (50.00%), and eating snacks consumed more than three times a day by 27 children (48.21%). The results of the lowest diet with a percentage of 10.71% each, namely the pattern of eating bread that is consumed more than once a day (6 children eat bread 2-3 times a day and six children eat bread more than three times a day), and six children eat cake more than three times a day.

The knowledge and attitudes of parents towards oral hygiene of parents of preschool-aged children in Kober Baitul Ulum, Cianjur belong to the "good" category as many as 55 people (98.21%) while a person (1.79%) is categorized as "not good". The behavior of preschool-aged children in maintaining oral hygiene during the Covid-19 pandemic with the highest percentage, namely in terms of brushing

teeth using a soft-bristled toothbrush and using toothpaste as many as 46 people (82.14%) each.

Participant's Characteristics	frequency (f)	Percentage (%)
<b>Status</b>		
Mother	46	82,14
Father	10	17,86
<b>Total</b>	<b>56</b>	<b>100,00</b>
<b>Education Levels</b>		
SD (Primary school)	5	8,93
SMP/SLTP (Middle school)	21	37,50
SMA/MA/STM/SMU/SMK/SLTA (High school)	24	42,86
D3 (Diploma)	4	7,14
S1 (Bachelor degree)	2	3,57
<b>Total</b>	<b>56</b>	<b>100,00</b>
<b>Occupations</b>		
Housewife	36	64,29
Home asisstant	1	1,79
Employee	10	17,86
Laborer	3	5,36
Entrepreneur	2	3,57
Midwife	1	1,79
Nurse	1	1,79
Teacher	2	3,57
<b>Total</b>	<b>56</b>	<b>100,00</b>
<b>Children's Gender</b>		
Male	25	44,64
Female	31	55,36
<b>Total</b>	<b>56</b>	<b>100,00</b>
<b>Children's Age (years)</b>		
4	1	1,79
5	22	39,29
6	33	58,93
<b>Total</b>	<b>56</b>	<b>100,00</b>

**Table 1.** Distribution of frequency of respondents and preschool children's characteristics.

Cariogenic Foods Type	Eating Pattern Frequency								Total	
	Once a day		2-3 times a day		>3 times a day		Never		F	%
Bread	36	64,29	6	10,71	6	10,71	8	14,29	56	100,00
Cake	25	44,64	24	42,86	6	10,71	1	1,79	56	100,00
Candy	22	39,29	20	35,71	9	16,07	5	8,93	56	100,00
Chocolate	28	50,00	9	16,07	12	21,43	7	12,50	56	100,00
Snacks	13	23,21	14	25,00	27	48,21	2	3,57	56	100,00

**Table 2.** Distribution of frequency of eating cariogenic food per day among preschool children aged 4-6 in Kober Baitul Ulum, Cianjur.

Category	frequency (f)	Percentage (%)
Good	55	98,21
Poor	1	1,79
<b>Total</b>	<b>56</b>	<b>100,00</b>

**Table 3.** Distribution of frequency of parents' knowledge and attitude in maintaining preschool children's oral hygiene.

The results that show the smallest percentage are the frequency of brushing teeth 2-3 times a day, cleaning the upper inner teeth, brushing the front teeth in a back and forth motion, and brushing the side teeth in a back and

forth motion, each choosing the rare category of 1 person (1,79%). Table 1, Table 2, Table 3, Table 4.

No.		Always		Sometimes		Rarely		Never		F	%
		f	%	f	%	f	%	f	%		
1.	Children brush their teeth 2-3 times a day	30	53,57	25	44,64	1	1,79	0	0,00	56	100,00
2.	Children brush their teeth before going to bed or after dinner	14	25,00	35	62,50	3	5,36	4	7,14	56	100,00
3.	Children brush their teeth after having breakfast	24	42,86	21	37,50	6	10,71	5	8,93	56	100,00
4.	Children brush their teeth by using soft bristles toothbrush	46	82,14	8	14,29	0	0,00	2	3,57	56	100,00
5.	Children brush their teeth by using toothpaste	46	82,14	10	17,86	0	0,00	0	0,00	56	100,00
6.	Children brush their inferior teeth	43	76,79	12	21,43	1	1,79	0	0,00	56	100,00
7.	Children brush their front teeth circularly	35	62,50	18	32,14	0	0,00	3	5,36	56	100,00
8.	Children brush their front teeth with back and forth or horizontal movement	37	66,50	13	23,21	1	1,79	5	8,93	56	100,00
9.	Children brush their sides teeth back and forth or by horizontal movement	34	60,71	21	37,50	1	1,79	0	0,00	56	100,00
10.	Children brush their sides teeth circularly	31	55,36	21	37,50	2	3,57	2	3,57	56	100,00

**Table 4.** Distribution of frequency of preschool children's oral hygiene behavior during Covid-19.

## Discussion

The findings showed eating pattern of cariogenic food in preschool-age children in Kober Baitul Ulum, Cianjur seen from the frequency per day, with the highest percentage was found in the type of bread with a frequency of once a day, followed by consumption of chocolate once a day, and then three times a day of snacks. Those foods are easy to purchase, inexpensive, become children's favorite with their various taste, and matches with other foods. Bread is a food rich in carbohydrates with its soft texture, and everyone can enjoy it as a main dish or a side dish<sup>10</sup>. Chocolate is one type of food that has sticky consistency so that it easily sticks to the surface of the teeth<sup>11</sup>. Snacks are foods with various shapes, flavors, and colors so that they are attractive to children. The attachment of those foods in a long term can then be converted into bacterial acid in the mouth, causing oral health problems such as caries<sup>12</sup>. These foods were children's favorite choices among those aged 4-14 in Italy during Covid-19 in 2021. The study revealed that 3 out of 4 children had a poor diet, consuming biscuits, cookies, and snacks during the lockdown<sup>1</sup>.

This study showed good parental attitudes and knowledge in maintaining oral hygiene with 98.21% of parents categorized as "good". Parents who understand good oral hygiene can potentially decrease the risk of oral disease in children. Preschool children who have parents with poor knowledge tend to increase the number of dental caries<sup>13</sup>.

The preschoolers' behavior during the Covid-19 pandemic in Kober Baitul Ulum Cianjur showed that the activity of brushing teeth 2-3 times a day was already carried out by 30 children (53.57%) which is highly recommended to maintain the children's oral hygiene<sup>14</sup>. Apart from the frequency, brushing teeth also has to be done at the right time which is after breakfast and before going to bed every two minutes that have not been performed by all children<sup>11</sup>. Maintaining good oral hygiene must also consider the equipment and materials being used. The tools used are a toothbrush with soft bristles and fluoride toothpaste, which can show maximum results<sup>15</sup>. In addition to using a soft-bristled toothbrush, 46 children (82.14%) also used toothpaste while brushing-teeth together<sup>15</sup>.

In this study, children have performed various techniques in maintaining oral hygiene through daily brushing activities on the internal and external parts of the teeth. Cleaning the internal teeth requires good skills because this section requires brushing on each tooth sextant. Unlike the outside of the teeth which can be cleaned by two sextants simultaneously, namely between the opposing teeth. There were still 12 children (21.43%) and a child (1.78%) who still cleaned their internal part of teeth occasionally because of difficulty cleaning and controlling the visuals<sup>16</sup>.

Generally recommended tooth-brushing motion is horizontal or back-and-forth movements and Fones or circular techniques, but there is controversy over the use of these techniques for children. Several studies have shown that the horizontal motion in children can help remove plaque more effectively than the Fones technique. The Fones technique is also confirmed to be good because it can remove plaque quickly and expand with its circular motion. Both of these techniques have their respective drawbacks to the gingiva and tooth structure, so when children are eight years old and over, the horizontal technique must be changed to a circular motion because their motor skills are already good<sup>17</sup>.

Based on this research, there are some limitations including the number of respondents (56 people), which is still lacking in providing a broader view. This research also cannot compare the condition during Covid-19 and non-Covid-19. This study also used a questionnaire with closed questions without intraoral examination, and the

result is very dependent on the assessment and answers of respondents. More in-depth investigations such as clinical examinations with a broader range of respondents and broader questions can be carried out as suggestions from researchers to provide more accurate information regarding diet and oral hygiene during the Covid-19 pandemic in preschool children.

## Conclusions

The distribution of cariogenic types of diet, attitudes, knowledge, and behavior in maintaining oral hygiene during the Covid-19 pandemic at preschool age, especially in Kober Baitul Ulum Cianjur, can be concluded as follows, during the Covid-19 pandemic, the highest cariogenic foods consumed included bread, chocolate, and snacks. Parents mostly have good attitudes and knowledge of their children's dental and oral hygiene, but children's behavior in maintaining dental and oral hygiene through brushing teeth still needs to be enhanced in the frequency of time, equipment used, and techniques. Proper parental guidance is necessary for choosing a good diet and maintaining the oral hygiene of the children.

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## Declaration of Interest

The authors report no conflict of interest.

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