

Knowledge about oral health, salivary PH, body mass index and its relationship with dental caries in preschool children

Conocimiento en salud bucal, PH salival, índice de masa corporal y su relación con caries dental en preescolares

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Abstract

Introduction: Dental caries is a disease caused by the interaction of several factors, including diet, since the development of the biological environment that promotes cariogenic bacterial metabolism often depends on it.

Objectives: To determine the prevalence of caries in preschool children from Huaura, Peru, and to confirm if there is an association between their salivary pH and body mass index (BMI) and the level of knowledge about oral health of one of their parents.

Materials and methods: A non-experimental, correlational, and cross-sectional study was conducted in 126 preschoolers equally distributed in 3 age groups (3, 4, and 5 years old). The association between the presence of caries and the variables considered was determined by means of the chi-square test of independence, with a confidence level of 95% and a type I error of 5%. In addition, a multiple logistic regression analysis was performed to calculate the probability of caries development in relation to each risk factor.

Results: The prevalence of caries was 80.2% (95%CI:73.2-87.2); furthermore, salivary pH ($p=0.012$) and the level of parental knowledge ($p<0.001$) were significantly associated with caries occurrence. Regarding the multiple regression analysis, an OR=0.12 (95%CI:0.02-0.63) was obtained for pH and an OR=0.50 (95%CI:0.35-0.74) for the level of parental knowledge in relation to the probability of caries development.

Conclusion: The level of parental knowledge about oral health and high salivary pH levels of preschoolers were protective factors against caries development in the study population. On the other hand, no association was found between BMI and the presence of caries in 5-year-old preschoolers.

Keywords: Prevalence; Dental Caries; Knowledge; Body Mass Index; Hydrogen-Ion Concentration (MeSH).

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Resumen

Introducción. La caries dental es una condición causada por la interacción de múltiples factores, entre ellos la dieta, ya que, con frecuencia, de ella depende el desarrollo del medio biológico propicio para el metabolismo bacteriano cariogénico.

Objetivo. Determinar la prevalencia de caries en preescolares de Huaura, Perú, y confirmar si hay una asociación con el pH salival y el índice de masa corporal (IMC) de los preescolares, y con el nivel de conocimiento en salud bucal de uno de sus padres.

Materiales y métodos. Estudio no experimental, correlacional y transversal realizado en 126 preescolares distribuidos equitativamente en 3 grupos etarios (3, 4 y 5 años). La asociación entre presencia de caries y las variables consideradas se determinó mediante la prueba de independencia de chi cuadrado, con un nivel de confianza del 95% y error tipo I del 5%; además, se realizó un análisis de regresión logística múltiple para calcular la probabilidad de ocurrencia de caries en relación con cada factor de riesgo.

Resultados. La prevalencia de caries fue de 80.2% (IC95%:73.2-87.2); además, el pH salival ($p=0.012$) y el nivel de conocimiento de los padres ($p<0.001$) se asociaron significativamente con la ocurrencia de caries. En cuanto al análisis de regresión múltiple, se obtuvo un OR=0.12 (IC95%:0.02-0.63) para el pH y un OR=0.50 (IC95%:0.35-0.74) para el nivel de conocimiento de los padres en relación con la probabilidad de presentar caries.

Conclusión. El nivel de conocimiento sobre salud bucal de los padres y los niveles altos de pH salival de los preescolares fueron factores protectores frente al desarrollo de caries en la población de estudio. Por otra parte, no se encontró asociación entre IMC y presencia de caries en los preescolares de 5 años.

Palabras clave: Prevalencia; Caries dental; Conocimiento; Índice de masa corporal; Concentración de iones de hidrógeno (DeCS).

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Introduction

According to an analysis of the Global Burden of Diseases, Injuries, and Risk Factors Study 2016, half of the world's population, or approximately 3.58 billion people, have oral cavity alterations, with dental caries being the most prevalent condition; for example, it is estimated that more than 486 million children suffer from caries in deciduous teeth.¹

Ojeda-Gomez & Davila-Guarniz² reported that caries in early childhood (6 to 72 months) in Peru has a prevalence that varies between 43% and 65.8%, so it is critical that parents use appropriate mechanisms to prevent its development. The prevention of dental caries is also fundamental since its etiology includes dysbiosis, which is caused by acidogenic and aciduric organisms such as *Streptococcus mutans*, a bacterium that metabolizes carbohydrates in the mouth, thus releasing lactic acid and causing the salivary pH to drop to 5.5. The latter value is critical since the hydroxyapatite crystals of the enamel begin to demineralize and, consequently, lose the calcium present in their chemical composition.³⁻⁷ This, according to several authors,⁸⁻¹⁸ could be avoided if parents acquired and used knowledge about preventing dental caries, as they could provide their children with an adequate diet and proper oral hygiene routines.

In this sense, caries is a topic of interest and various studies have been carried out around the world. For instance, in Mexico, Aguilar-Ayala *et al.*¹² studied 63 children aged 9 to 48 months and found a caries prevalence of 35% and, in Colombia, Chavarria *et al.*¹³ studied 589 children and reported that the prevalence of this condition was 93%. Furthermore, although there are differences between studies, both recommended training parents on oral health issues as a strategy to reduce caries development in their children.

In Peru, different research has also been carried out on the subject. In 2015, Cupe-Araujo & Garcia-Rupaya⁸ conducted a study in 312 parents with preschool children in which they validated an instrument to measure knowledge about oral health among mothers and fathers; in 2011, Sarmiento *et al.*⁹ determined that the prevalence of caries in children aged 6 to 71 months from marginal urban communities in Lima was 62.3%, a figure considered high, and, in 2012, Benavente *et al.*,¹⁰ in a sample of 143 mothers with their children under the age of 5, established that the prevalence of caries was high (64.3%) and that the level of parental knowledge about oral health of most mothers (77.6%) was between fair and good, thus establishing that there is no inverse relationship between both variables.

In turn, body mass index (BMI) and nutritional status of children are factors that have been associated with caries development, although conflicting results on this association have also been reported.¹⁹⁻²¹

According to this scenario, it is evident that the prevalence of caries is a problem of concern throughout Latin America. In Peru, few studies have been carried out in areas far from the capital, so it was decided to carry out the present research in the locality of San Bartolomé in the district of Santa Maria, in Huaura. This population

is characterized by a lack of economic resources, a poor educational level and a significant amount of dysfunctional families that are little involved in the oral health of their children.²² Similarly, in this zone, there is a shortage of educational material on dental care and professional staff to care for children in the health post, which makes it difficult for dentists to provide adequate treatment to their patients and increases the likelihood that children will develop cavities.²²

In this sense, the objective of this study was to determine the prevalence of caries in preschoolers treated at the Huaura health post and to confirm whether there is an association between salivary pH and the BMI of preschoolers and the level of parental knowledge about oral health of one of their parents.

Materials and methods

Study type and population

Non-experimental, correlational, and cross-sectional study.²³ The study population consisted of all preschoolers treated at the Huaura health post between January 1 and June 30, 2019 (N=257.)

The sample size included 126 preschoolers (each with one of their parents to assess their level of knowledge), which was calculated using the Stata®15 statistical package based on the data obtained from a pilot study, using the ratio comparison formula, and a significance level and a statistical power of $\alpha=0.05$ and $1-\beta=0.8$, respectively. Participants were recruited by stratified random sampling, according to the inclusion and exclusion criteria described below, until the required number per group was reached, since they were randomly distributed into three groups of 42 preschool children depending on their age (3, 4, and 5 years old).^{23,24}

Inclusion criteria

- Being between 3 and 5 years old.
- Having attended the dental service of the dental care center in the locality of San Bartolomé during the study period.
- Being enrolled in the Comprehensive Health System (SIS by its acronym in Spanish)
- Having an informed consent signed by one of the parents.

Exclusion criteria

- Having some systemic disease.
- Having special needs (any type of disability).

Study variables

The present study evaluated four variables (prevalence of dental caries, level of parental knowledge about oral health, BMI, and salivary pH value), which were measured with different instruments, as explained below.

Prevalence of dental caries

The ceo-d index (sum of deciduous teeth with caries (c), extracted (e), or filled (o)) was used to establish the

presence of caries in schoolchildren ($ceo-d > 0$ = presence of caries). This information was recorded in the odontogram proposed by the Ministry of Health of Peru in Resolution 272 of 2019.²⁵

The criteria for diagnosing a tooth with caries included an undermined or appreciably softened enamel, as well as a lesion in the pit or fissure or on a soft dental surface with an unmistakable cavity. Temporary or decay fillings were also included in this category. Absent deciduous teeth without a valid justification based on the age of the participant were considered as extracted teeth. Finally, fillings in teeth free of caries were considered as filled teeth.²⁶

To calculate the prevalence of caries among the participants, the total number of preschoolers with this condition was counted and divided by the total number of preschoolers examined; this calculation was made by groups (3, 4, and 5 years) and for the entire sample.¹⁴

Level of parental knowledge about oral health

To measure this variable, a questionnaire previously validated in Peruvian preschoolers was used (Annex 1).⁸ This instrument consists of 20 closed questions about oral health knowledge with four response options that must be completed anonymously within a time limit of 30 minutes. The score ranges from 0 to 20 (1 point per question) and the level of knowledge is considered very poor with scores from 0 to 5, poor with scores from 6 to 10, fair with scores from 11 to 14, and good with scores from 15 to 20.⁸

BMI

This variable was measured based on the WHO Child Growth Standards for sex, height (cm), weight (kg) and age (years and months). The following BMI classification categories were observed in boys: severe malnutrition: < 12.1 , moderate malnutrition: $12.1 - 12.9$, normal weight: $13.0 - 16.6$, overweight: $16.7 - 18.3$, and obesity > 18.4 . The values obtained in girls were: severe malnutrition: < 11.8 , moderate malnutrition: $11.8 - 12.6$, normal weight: $12.7 - 16.9$, overweight: $17 - 18.9$ and obesity: > 19 .⁵

Salivary pH value

The instrument used to measure salivary pH levels was a HENAN® Pen Type pH Meter 400 microprocessor with a range of 0.00–14.00pH, previously calibrated. Here, values ≤ 6.49 were considered risky, 6.50 to 6.79 were acceptable, and ≥ 6.80 were good.⁵

Procedures

Salivary pH was measured by 2 authors (KRSE and CFR). The measurement process for this variable was calibrated in the pilot study by means of an intra-examiner (KRSE) and inter-examiner reproducibility (KRSE and CFR) analysis, using the Pearson correlation coefficient, and obtaining very good values: 0.92 and 0.90, respectively. In addition, the same two authors determined the presence or absence of caries in children according to the $ceo-d$ index, a process that was also subjected to intra-examiner

and inter-examiner calibration using Cohen's kappa coefficient, obtaining very good values as well: 0.87 and 0.82, respectively.

Participants were summoned to the San Bartolomé health office, along with one of their parents, for individualized care. These appointments took place in the evenings (outside working hours) and over a 3-month period; 4 to 5 different children were scheduled each day.

During the individual appointment, children were asked to brush the oral cavity in the presence of the dentist. Subsequently, their caries index ($ceo-d$) was determined using dental examination equipment (mirrors, explorer, and artificial light) and the results were recorded on the odontogram.

While one dentist examined the child's oral cavity, another (neutral observer) evaluated the parent (who signed the informed consent) in the same office using the questionnaire designed for that purpose.⁸

Due to the lack of engagement of some parents and the difficulty of performing this procedure with children aged 3 and 4, only parents of 5-year-olds were asked to accompany their children to the nutrition clinic to have their BMI measured by a professional with more than 10 years of experience and to return to the office with the results to attach them to the odontogram.

Parents were instructed not to allow their child to eat any food until salivary pH was measured. Approximately an hour after the children brushed their oral cavity, a saliva sample was collected in a sterile container and utilized to measure this variable. After each measurement, the digital pH meter was cleaned with distilled water, dried with absorbent paper, and recalibrated for its next use to avoid biased results.

At the end of the process, all parents, individually and in the presence of their child, were trained on proper brushing practices and explained the importance of eating a diet low in processed carbohydrates.

Statistical analysis

Data were stored in Microsoft® Excel 2016 and single-blind processed in SPSS® version 24. The association between the presence of caries and the categorical variables considered (level of parental knowledge about oral health, BMI, and salivary pH value) was determined using the chi-square test, with a confidence level of 95% and a type I error of 5%. However, as mentioned above, it was not possible to include children aged 3 and 4 in the association between BMI and the presence of dental caries because values for this variable could not be established in these age groups.

Likewise, a multiple logistic regression analysis was performed to calculate the probability of caries occurrence in relation to each risk factor.

Stratified analysis of the sample was not considered due to the sample size and because the characteristics of the participants were similar, so it was analyzed as a single group.

Ethical considerations

The study took into account the ethical principles for medical research involving human beings established by the Declaration of Helsinki.²⁷ Likewise, it was approved by

the research committee of the Universidad Alas Peruanas in accordance with Resolution No. 048-2018-DG-UAP-Filial Huacho on December 31, 2018, and the informed consent signed by the parents was obtained, as well as the informed assent of the children.

Results

The overall prevalence of caries was 80.2% (95%CI: 73.2-87.2). Details of the prevalence found are presented in Table 1 according to the age of the participants.

Table 1. Prevalence of dental caries in participants.

Age	Absence of caries		Presence of caries		Total	
	fi	%	fi	%	fi	%
3-year-olds	12	28.57%	30	71.42%	42	100%
4-year-olds	7	16.66%	35	83.33%	42	100%
5-year-olds	6	14.28%	36	85.71%	42	100%
Total	25	19.84%	101	80.15%	126	100%

fi: absolute frequency.

Source: Own elaboration.

Regarding the level of parental knowledge about oral health, it was found that the most common levels in the parents of preschoolers without caries were fair and good, thus establishing a highly significant relationship ($p < 0.001$) (Table 2).

As for BMI, it was established that most participants in the 5-year-old group ($n = 42$), with and without caries, presented moderate malnutrition, so the association between both variables was not significant ($p > 0.05$) (Table 3).

Table 2. Level of parental knowledge about oral health in relation to the presence of caries in the participants.

Level of knowledge	Absence of caries		Presence of caries		Total		p-value
	fi	%	fi	%	fi	%	
Very poor	0	0.00%	16	15.84%	16	12.69%	<0.001
Poor	2	8.00%	45	44.55%	47	37.30%	
Fair	14	56.00%	32	31.68%	46	36.50%	
Good	9	36.00%	8	7.92%	17	13.49%	
Total	25	100%	101	100%	126	100%	

fi: absolute frequency.

Source: Own elaboration.

Table 3. Relationship of body mass index with the presence of caries in 5-year-old children.

Body mass index	Absence of caries		Presence of caries		Total		p-value
	fi	%	fi	%	fi	%	
Moderate malnutrition	5	83.33%	30	83.33%	35	83.33%	0.691
Normal	1	16.66%	6	16.66%	7	16.66%	
Total	6	100%	36	100%	42	100%	

fi: absolute frequency.

Source: Own elaboration.

Salivary pH levels in the caries-free group were mostly classified (76%) as good, and these values were higher than those in the caries group (57.4%). Therefore, both

variables were significantly associated, that is, the salivary pH value is significantly associated with the presence of caries ($p = 0.012$) (Table 4).

Table 4. Relationship of salivary pH value to presence of caries in participants.

pH value:	Absence of caries		Presence of caries		Total		p-value
	fi	%	fi	%	fi	%	
Risky	4	16.00%	25	24.75%	29	23.01%	0.012
Acceptable	2	8.00%	18	17.82%	20	15.87%	
Good	19	76.00%	58	57.42%	77	61.11%	
Total	25	100%	101	100%	126	100%	

fi: absolute frequency.

Source: Own elaboration.

Salivary pH values and parental level of knowledge about oral health were significantly and independently associated with the presence of caries ($p=0.012$ and $p<0.001$, respectively). In addition, both were protective factors since the OR (Odds Ratio) were <1 : for pH value; an

OR=0.12 indicated that those with values ≥ 6.8 were 88% less likely to have cavities, while an OR=0.5 for parental knowledge indicated that the children of parents with higher knowledge scores were 50% less likely to develop caries (Table 5).

Table 5. Multiple logistic regression of the presence of caries with risk factors in the study population.

Variables	Category	p-value	OR	95%CI
BMI	Moderate malnutrition	-	1.00	-
	Normal	0.691	0.72	0.43-1.21
pH value:	≤ 6.79	-	1.00	-
	≥ 6.80	0.012*	0.12	0.02-0.63
Knowledge about oral health	0-10 points	-	1.00	-
	11-20 points	$<0.001^*$	0.50	0.35-0.74

OR: odds ratio; CI: reliability index.

p-value statistically significant.

Source: Own elaboration.

Discussion

The prevalence of caries found in the present study for the 5-year-old group (85.7%) is similar to that reported by Villena-Sarmiento *et al.*⁹ (86.9%). However, prevalence in the 3- and 4-year-old groups studied here (71.4% and 83.3%, respectively) were slightly higher than those reported by these researchers (65.5% and 73.4%, respectively), probably because the population sampled by Villena-Sarmiento *et al.*⁹ was in the metropolitan area of Lima and, therefore, some parents could access a dental office, health center or hospital more easily to learn how to take care of their children's oral health. This explanation is supported by the results reported by Montero-Canseco *et al.*¹⁷ and Diaz-Cardenas *et al.*¹⁸ in their studies, in which both obtained a low prevalence of caries in Mexican (59.6%) and Colombian (51%) preschool children, respectively.

Similarly, the prevalence of caries found by Aguilar-Ayala *et al.*¹² in children between 9 and 48 months of age was 35%, which differs considerably from the results obtained here, probably because the present research was carried out in a rural district with few preventive programs that promote oral health, considering that only two dentists work in the main health post of San Bartolomé, and resources are not sufficient to carry out prevention campaigns in schools.

In addition, the study of Aguilar-Ayala *et al.*¹² was carried out in a population that received early stimulation for this type of care at the Universidad Autónoma de Yucatán (Mexico), which undoubtedly allowed parents to acquire more knowledge about oral health and, consequently, reduce the risk of developing caries among their children. Likewise, the prevalence found here was slightly lower than that reported by Chavarria *et al.*¹³ (80.2% vs. 93%), which may be due to a larger sample size in this study.

In turn, Cupe-Araujo & Garcia-Rupaya,⁸ in a study conducted in Lima, demonstrated that the level of knowledge about oral health among parents of children aged 3 to 5 who had caries is predominantly very poor and poor, with both variables being very significantly associated. This is similar to the findings reported in the present

research, although it was developed in a geographical area far from Lima.

It is worth mentioning that this significant association between caries prevalence and level of parental knowledge about oral health had already been noted in the pilot study, so it was decided to use the same instrument (Annex 1). Nevertheless, the correlation strength reported in the present article contrasts with the results obtained by Benavente-Lipa *et al.*¹⁰ since these authors showed that the knowledge of oral health among mothers from a specific area of Lima was between fair and good, and their children had a high prevalence of caries (64.3%), making it clear that good knowledge about oral health by the parents does not reduce the development of caries in children. This difference may be explained by the fact that the validation of the questionnaire used by Benavente-Lipa *et al.*¹⁰ was deficient since it was administered without undergoing expert judgment, construct analysis or reproducibility, and reliability tests, procedures that were applied on the instrument used here.

The present study showed that there is no significant association between the presence of dental caries and BMI, which is consistent with other studies.^{19,28} However, it is important to mention that in the works by So *et al.*²⁰ and Moblely *et al.*,²¹ a significant association between the presence of caries and malnutrition was found since, according to these authors, the pain caused by caries can cause lack of sleep in children and thus alter the hormones ghrelin and leptin and cause appetite disorders.^{20,21} In any case, this difference may be explained by the fact that nutritional status is not the same as body mass index, considering that the latter is one of the indicators used to evaluate nutritional status. It should be noted that this association was only evaluated in the 5-year-old preschool group, so these results should be taken with caution and confirmed in studies with larger samples.

Similarly, the present research found an inverse relationship between the salivary pH value and the prevalence of dental caries, which may be associated with the fact that this value depends directly on the amount of lactic acid released by cariogenic bacteria after metabolizing carbohydrate: typically, this pH should return to normal

after 60 minutes at most; however, time may be extended if there is a significant bacterial load.^{4,6,29,30} Consequently, it is critical to raise awareness among parents, through educational sessions, to provide their children with healthy foods that are low in carbohydrates.

The relevance of this research lies in understanding the potential risk factors for the prevalence of caries in preschoolers; for this reason, it is essential that oral health is promoted both in health posts and in schools to encourage good oral hygiene practices and the consumption of a healthy diet low in carbohydrates, as this will result in a lower occurrence of caries and, in the long run, a lower economic burden.

One of the limitations of this study was the inability to assess BMI in children aged 3 and 4 years. Moreover, cariogenic diets, the use of fluoride toothpastes, the level of education of the parents and their presence in the family nucleus, and household income were not included in the present study as possible risk factors for caries development and, since they could be significant, it is recommended that they be considered in future research.³¹⁻³⁴ On the other hand, it is suggested to evaluate the association between caries prevalence and the participants' nutritional status using other tools, such as the WHO AnthroPlus software version 3.2.2 for children under 5 and the WHO AnthroPlus software version 1.0.4 for children between 5 and 6.²⁰

Conclusions

The prevalence of caries was high among the study population. Furthermore, the level of parental knowledge about oral health and high salivary pH values in preschoolers were protective factors against tooth decay. Finally, no relationship was found between BMI and caries in preschoolers aged 5 years.

Conflicts of interest

None stated by the authors.

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Annex 1. Questionnaire to assess the level of parental knowledge about oral health

Date: _____

Your child's age:

a) 3 years b) 4 years c) 5 years

Who is completing the questionnaire?

a) Father b) Mother

Informant's age: _____

Educational attainment of the father:

a) None b) Primary education c) Secondary education d) Technical and/or Higher education

The questionnaire is designed so that you, at your discretion, mark the appropriate response using a cross mark (X).

Dental caries

1. *What is dental caries?*

- a) It is a disease that occurs in malnourished children.
- b) It is not a disease
- c) It is a disease caused by poor oral hygiene and sugar consumption
- d) It is a disease caused by poor oral hygiene and consumption of fried foods

2. *The bacteria that cause tooth decay can be transmitted by*

- a) Sharing utensils
- b) Sharing toothbrushes
- c) Kissing the child in the mouth
- d) All of the above

3. *What is dental plaque?*

- a) A hard film that coats the surface of the teeth
- b) A soft film that coats the surface of the teeth
- c) Tartar that forms on the teeth
- d) A mass found only in the teeth of adults

4. *Are baby teeth important?*

- a) Yes, because they make space for permanent teeth
- b) No, because they do not serve any purpose
- c) No, because they will be eventually lost
- d) No, because they are not permanent teeth

5. *At what age should all baby teeth have erupted?*

- a) Age 2
- b) Age 4
- c) Age 6
- d) Age 8

Prevention

6. *The first visit to the dentist office should be:*

- a) At 2 years of age
- b) When the first baby tooth erupts
- c) When we have our permanent teeth
- d) Only if there is pain

7. *What are the benefits of fluoride that you are aware of?*

- a) It strengthens teeth and prevents tooth decay
- b) It heals teeth to prevent extractions
- c) Fluoride has a whitening action in children
- d) It strengthens the child to grow up healthy and strong

8. *Is it necessary to visit the dentist when you have healthy teeth?*

- a) Yes, for a routine dental check-up
- b) Only if you have crooked teeth
- c) No, since it is not necessary if you do not any discomfort
- d) Only if my child has mouth discomfort

9. *If your child loses a baby tooth early because of cavities, do you think it may affect the position of the teeth?*

- a) Yes
- b) Probably, only if the molars are lost
- c) No
- d) Baby teeth are not important

10. *What preventive measures do you know to fight tooth decay?*

- a) Fluoride
- b) Good oral hygiene
- c) Avoid excessive consumption of sugars
- d) All of the above

Diet

11. *What foods do you think are best for healthier teeth?*

- a) Fruits and vegetables
- b) Soda and fruit
- c) Nectars and cookies
- d) All of the above

12. *What is recommended for your child's lunch box?*

- a) Cheese, quinoa, fruit, egg, bread, meat.
- b) Sweet cookies, chocolate, cakes, boxed soft drinks.
- c) Nectars, chocolate milk, cheese balls
- d) All of the above

13. *With regard to sugar consumption, mark the correct statement:*

- a) The child should never consume sugar
- b) The child may consume sugar at various times during the day
- c) The child may consume sugar at certain times and then brush their teeth
- d) All of the above

14. *Up to what age is breastfeeding recommended?*

- a) Up to 15 days of age
- b) Up to 3 months of age
- c) Up to 6 months of age
- d) Up to one year of age

15. *What would happen if you let your child drink from a baby bottle filled with sugary liquids all night?*

- a) He/she is going to be stronger when he/she wakes up
- b) He/she will be stronger and healthier
- c) He/she will be more exposed to tooth decay
- d) Nothing

Oral hygiene

16. *How many times a day should the child brush his/her teeth?*

- a) 1 time
- b) 2 to 3 times
- c) 5 or more times
- d) Children should not brush their teeth

17. *From what age can fluoride toothpaste be used?*

- a) From 2 years of age
- b) From 5 years of age
- c) From adolescence onwards
- d) In children under 2 years of age

18. *Is brushing recommended after each meal?*

- a) No
- b) Only before sleeping
- c) Just using a mouthwash is enough
- d) Yes

19. *How often should the toothbrush be changed?*

- a) Every 3 months
- b) Every 8 months
- c) Once a year
- d) Never

20. *As for toothbrushing*

- a) The child can brush his/her own teeth
- b) Parents should supervise their children's toothbrushing at this age
- c) Only children over the age of three should brush their teeth
- d) Children's teeth should be brushed without toothpaste