



## Investigation on the Correlation Between Children's Eating Pattern and the Prevalence of Caries in Students of Basic Education at the General Córdova Educational Unit of the Pishilata Parish

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Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 11 Sept 2023	<i>Food plays a crucial role in the development and well-being of the organism, being a fundamental source of energy and nutrients for the proper functioning of the human body. However, the quality of the food we eat also has a significant impact on our health, including dental health. In this study, we will focus on analyzing the possible influence of diet on dental hygiene, especially in children between the ages of 7 and 8, who mostly still have milk teeth. To carry out this study, we have adopted a methodology based on data collection through direct surveys of representatives of children in the specified age range. These surveys will allow us to collect valuable information about children's eating habits, the frequency of consumption of foods high in sugar and carbohydrates, as well as the dental hygiene practices implemented. Through the dissemination of accurate and well-founded information, it is hoped to promote healthy habits in the child population, which in turn can have a positive impact on their dental well-being throughout their lives. In addition, this study can serve as a basis for future research and enrich the field of Dentistry in the approach to oral health at an early age.</i>
CC License CC-BY-NC-SA 4.0	<b>Keywords:</b> <i>Dentistry, diet, dental hygiene, sugar consumption, milk teeth.</i>

### 1. Introduction

All research requires careful planning, seeking to establish aspects such as the premise that supports the research, the point of view that will support it, the procedures to be followed and the tools and instruments that will be used throughout it, with which we can determine that research planning with a quantitative approach takes the form of a research budget that essentially includes a strategy and a defined work plan. by the researcher <sup>(1-2)</sup>, in a manner consistent with the approach to the research problem.

This approach uses statistical analysis. It is given from the collection, the measurement of parameters, the obtaining of frequencies and population statistics. It poses a delimited and concrete study problem <sup>(3-4)</sup>. Your research questions are about specific issues. Once the study problem is raised, review what has been previously investigated. This activity is known as literature review.

The research model used is the one that allows to obtain a defined structure with a pattern, used for planning, inquiry and critical analysis of the purpose of study. It also helps to answer the various questions or hypotheses of the research. Therefore, it is important to have a preparation and

understanding of existing qualitative or quantitative kinds of research. Indeed, it is becoming increasingly common for researchers to use these tools within studies <sup>(5-6)</sup>.

The results are reflected in a philosophy of post-positivist thought, where the cause tends to be examined in order to yield conclusive results. The approach is exclusive to deduction, where ideas or concepts have independent variables (causes) and dependent variables (effect) that correlate with each other, and are also bent against a test <sup>(7-8)</sup>. As a purpose, it exposes a knowledge based on observation and the result, in addition to the objective to be studied. Quantitative research or also called empirical-analytical involves the analysis of data such as numbers to obtain results.

The procedure that is carried out within quantitative research begins with the definition of a research question or problem, once the objectives are established, the implementation is prepared by an in-depth survey and the collection of relevant information on the basis of the preparation to conduct the research. As a second step, researchers develop the actual implementation and design of the study, as well as the appropriate research methodology and theories and hypotheses about the research problem identified in the first part. They are tested in the next stage of research which is largely determined by the selection of the appropriate target group <sup>(9-10)</sup>. When selecting test subjects, care must be taken to ensure that they meet the predetermined criteria as accurately as possible, as this is how clear results can be obtained. (Qualtrics). The survey is a technique that uses a set of standardized research procedures through which a series of data is collected and analyzed from a sample of cases representative of a population or wider universe "therefore it is intended to explore, describe, predict and explain a series of characteristics, which helps us to structure the problem, the design, data collection, analysis, interpretation and dissemination of our research. Empirical-analytical research is used in various techniques or tools for data collection through interviews, surveys, questionnaires, etc. Unlike the qualitative, it acts according to the opinions, feelings and aptitudes to be able to sustain all kinds of questions, percentages and indices that will manage the determined population <sup>(11-12)</sup>.

The present study is descriptive and observational in nature, focused on a group of 40 children aged between 6 and 7 years, belonging to the General Córdova Educational Unit located in the parish of Pishilata, according to INEC 180108. For the development of the study, a sample of 33 children was selected, and data collection was carried out through surveys applied to the parents of said educational establishment.

One of the fundamental aspects addressed in this study is the importance of oral hygiene as a prevention system against the most frequent oral pathologies, especially dental caries <sup>(13-14)</sup>. This disease not only affects the physiology and aesthetics of dentistry, but also has a significant impact on the child population, in accordance with the development of their essential period.

Dental caries is a condition of multifactorial nature, with an infectious and transmissible origin, which affects the dental structures and causes a progressive degradation of the hard tissues of the teeth. This chronic disease is one of the most prevalent in childhood and can have long-term negative consequences on the oral health of children.

The observational approach of the study will allow to obtain valuable information about the oral hygiene practices that are carried out in this group of children and their possible relationship with the presence of dental caries. The data collected through the surveys applied to parents will provide a more complete and accurate view of the oral care habits that prevail in the environment of these children.

It is important to highlight that the results obtained in this study could have significant implications for the promotion of oral health in children. Prevention and the establishment of good oral hygiene habits from an early age are essential to prevent the development of caries and other dental pathologies in childhood and throughout life.

## **2. Materials And Methods**

The study focused on infants in the first and second year of initial basic education, considering that they do not yet have definitive teeth. The main objective was to evaluate the prevalence of dental caries in deciduous teeth. Before starting the study, a previous visit to the educational institute was

made to conclusively explain the procedures and objectives of the study method to the parents and representatives of the schoolchildren.

Through an integrated information system, 33 parents were randomly selected collaboratively and voluntarily, who provided the relevant information for the development of the research process. Once the representative sample of the total number of infants under study was obtained, it was possible to verify that the determinants of health play a crucial role in the family environment, manifesting themselves in environmental situations, behavioral factors, diets high in carbohydrates and sugars, poor hygiene and genetic factors.

The analysis allowed to establish the lack of preventive and curative education at the general level, as well as the insufficiency of health centres that did not have the necessary supplies to control the possible conditions present in infants. A comprehensive health diagnosis was made in each family, evidencing the particularities related to dental disease, in this case, dental caries.

This study highlights the importance of prevention and oral care at an early age, since determining factors that contribute to the development of caries in baby teeth were identified. The results obtained serve as a basis for promoting educational strategies and promotion of oral health in the community studied, seeking to improve the quality of life of children and promoting healthy habits from an early age.

Likewise, it is recommended the implementation of policies and programs that strengthen the dental care system in health centres, thus ensuring timely and adequate care to prevent and treat dental conditions in infants. The interdisciplinary work between health professionals, educators and parents is essential to achieve a significant decrease in the prevalence of caries in this child population and promote good oral health throughout their lives.

#### **Eating foods high in sugar and salt, do not have a balanced diet between fruits and vegetables, which are essential for their development**

A structural model of public health in which it exposes the different determinants of health that influence the daily life of people with respect to the community in which they usually live, therefore, raises 4 important determinants in their development such as the environment, lifestyles, human biology and systems of health care organizations. For this reason, its complexity is currently reflected in the food that infants should eat during their development.

In addition, that diets should be non-cariogenic for children around this age, which could contribute to reducing the rate of caries in the population studied, since it had a high rate of poor diet due to the consumption of cookies, sweets and drinks high in sugar in their lunch boxes.

#### **Direct water consumption from the taps, therefore, the high degree of concentration of water with fluoride**

The standard reference value for water concentrated with fluoride in public supplies should include concentrations between 0,7 and 1,2 mg/L. In such a way there is still an abnormal coloration in the water where these people usually live, without knowing that, when consuming for prolonged periods, it brings consequences such as damage to the teeth (dental fluorosis) leaving the teeth more susceptible during their formation of their cavities.

While many nutrients are needed for the correct formation of dental development around its other current structures such as gums, making use of vitamins and proteins it is still very important to reduce the levels of fluoridation existing in the water in order to counteract these pathologies present in this educational community.

#### **Scarce visit to the dentist from the exit of the first tooth. They only went to the professional in case of severe pain in the oral cavity**

National Institute of Dental and Craniofacial Research <sup>(8-15)</sup>. It defines that it is of utmost importance to visit the dentist to prevent possible conditions in the future and thereby also contribute to a low economic expense to treat it, with this we can shorten the deterioration of the teeth from a young age. Therefore, it is stated that a form of prevention for these diseases, go as soon as it leaves the child

with the specialist in charge so that he is in charge of giving a correct hygiene routine until certain ages.

It refers to multiple possible strategies that the father of the family can use to avoid major health problems in their children, the view to the dentist from an early age will favor a correct training during their life cycle if you start with a hygiene habit in your brushing and effective cleaning implements.

### Biological factors tailored to the epidemiological consequences present in each family

The social circumstances in which the human being develops considerably affect their health, since they do not have sufficient conditions to survive, they are more likely to contract diseases compared to individuals who do have these resources. It refers to the economic possibilities that certain families may have to survive in the face of possible conditions that arise in the population.

Therefore, it is necessary to emphasize that in Ecuador the percentage of poverty tends to increase every day due to the lack of work in the regions, for this reason Ecuadorian families prefer to invest their money in food than in curative treatments for prevention of oral diseases due to the lack of money that these families present.

## 3. Results and Discussion

### Question 1: How do you consider your family's diet to be?

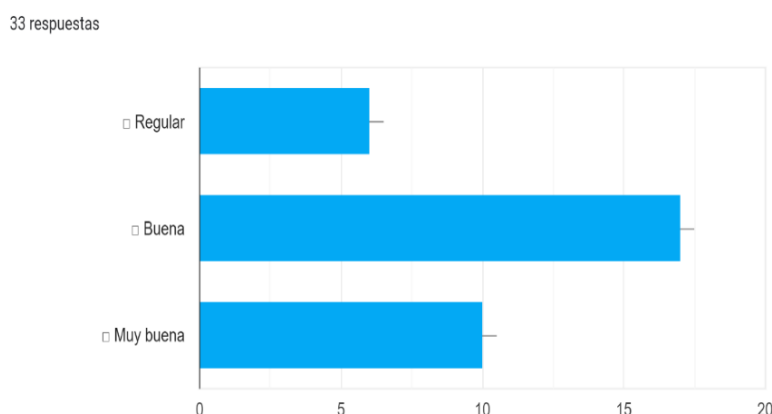


Figure 1. Family food.

The results obtained regarding the type of food that each family provides to its schoolchildren reveal a positive trend towards adequate and nutritious food. It is evident that most families strive to provide their children with a balanced diet, rich in vitamins and nutrients essential for their growth and development. This conscious choice of nutritious food contributes significantly to the general well-being of schoolchildren and promotes the proper functioning of their immune system, adapted to the demands of their age.

It is encouraging to note that the good nutrition of these children not only positively impacts their physical health, but also their emotional and cognitive well-being. A proper diet, rich in essential nutrients, promotes optimal cognitive development, allowing better academic performance and favouring their ability to concentrate and learn.

It is worth highlighting the relevance of food education and the fundamental role of parents and caregivers in the process of forming healthy eating habits. The fact that most families are providing nutritious food for their schoolchildren reflects a commitment to the health and well-being of their children.

However, it is important to recognise that there are still opportunities for improvement in this area. In some cases, it was possible to identify the need to increase the variety of foods in the diet of schoolchildren, ensuring adequate intake of all food groups. In addition, promoting healthy eating practices in the educational community can be an effective strategy to further strengthen positive eating habits.

**Question 2. How often does the child brush his or her teeth?**



**Figure 2. Brushing children**

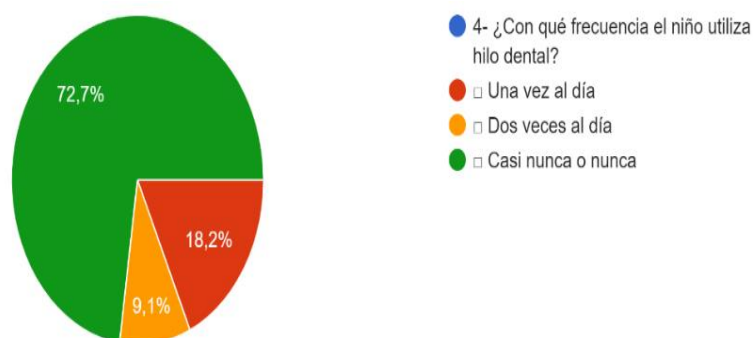
The analysis of the data presented in figure number two, gives us an interesting perspective on the oral hygiene habits of the children included in this study. It is pleasing to note that a significant 36% of the children surveyed brush their teeth three times a day, suggesting a good level of care and attention towards their oral health. This group of children, who show an adequate frequency of brushing, are likely to present optimal oral health, which will help prevent the onset of dental problems such as tooth decay and maintain a healthy and radiant smile.

However, it is also important to note that 42% of the children surveyed brush their teeth only twice a day, and 15% do so only once a day. These percentages indicate that a considerable proportion of children have less frequent brushing habits, which could have a negative impact on their oral health. Less frequent brushing can increase the risk of plaque buildup and cavities, which in turn could lead to future dental problems.

These data point us to an opportunity to promote greater awareness of the importance of proper oral hygiene from an early age. Educating children and their families about the importance of brushing their teeth at least three times a day, especially after each meal, can make a significant difference in their oral health and prevent future dental problems.

The presence of caries in children who brush twice a day or only once a day alerts us to the need to implement educational and preventive programs in the school and community environment. These initiatives could focus on promoting healthy oral hygiene habits, as well as the importance of limiting the consumption of foods rich in sugars and carbohydrates, which are risk factors for the appearance of caries.

**Question 3. How often does the child floss?**



**Figure 3. Flossing**

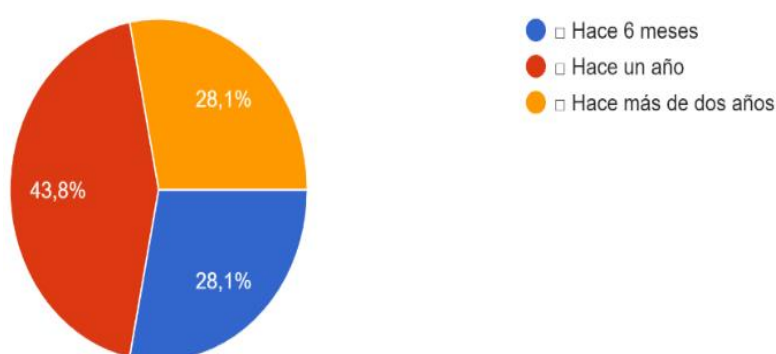
Figure number three reveals a worrying situation regarding the use of dental floss by the children included in this study. With more than 70% of children surveyed not flossing, there is evidence of a lack of awareness and practice of this important oral hygiene tool. Flossing plays a critical role in removing plaque and food debris that accumulate in interdental spaces, where the toothbrush cannot easily reach. The development of bacterial plaque in these areas can significantly increase the risk of cavities and gum disease.

Flossing complements the action of brushing, as it allows plaque and food debris to be removed between the teeth, places where cavities and periodontal diseases are easily formed. By incorporating its regular use into the oral hygiene routine, children can prevent plaque buildup and maintain a healthier mouth.

It is essential that parents, caregivers and educators play an active role in promoting and teaching the appropriate use of it to children from an early age. It is at this stage of life that habits are formed that last over time, and by instilling effective oral hygiene practices, the foundation is laid for good oral health in the future.

Implementing educational and preventive programs in schools and communities can be an effective strategy to encourage flossing and raise awareness of its importance. It is also necessary to remember that the use of dental floss must be complemented with a good brushing technique, the use of fluoride toothpaste and periodic visits to the dentist.

**Question 4.** When was the last time the child had cavities?



**Figure 4.** Presence of caries

The results are encouraging and point to a positive situation regarding the oral health of the children of the Educational Unit. The fact that 72% of children claim to have had no cavities in the last year reflects a trend towards good oral health in this population. This data highlights the importance of maintaining effective oral hygiene practices and a balanced diet to prevent the appearance of cavities.

It is relevant to mention that good oral health is not only limited to the absence of cavities, but also covers aspects such as gum health, tooth alignment and the prevention of periodontal diseases. Therefore, it is necessary to consider a comprehensive approach in children's oral care to ensure optimal oral health.

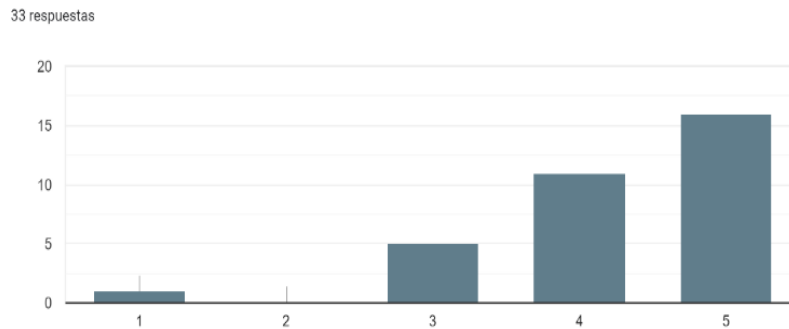
The fact that good oral health is related to good nutrition is a significant finding. A balanced diet, rich in essential nutrients such as calcium, vitamin D and vitamin C, is essential to maintain the integrity and strength of teeth and gums. Foods such as fruits, vegetables, dairy and lean proteins are essential for the development and maintenance of a healthy mouth.

In addition, incorporating proper oral hygiene habits from an early age can also contribute to children's good oral health. Correct brushing technique, flossing and regular visits to the dentist are essential measures to prevent dental disease and maintain a radiant smile.

However, it is important to note that although the results obtained are positive, it is necessary to continue with the promotion and education in oral health to maintain this positive trend in the long term. Prevention and proactive care are fundamental pillars to ensure

optimal oral health in children.

**Question 5.** Do you think eating a lot of sugary products is a risk factor for your child's oral health?



**Figure 5.** Sugar consumption.

Figure 5 presents the results of a key question related to a specific risk factor: sugar consumption. Participants were asked about their perception of whether the consumption of sugary products poses a risk to children's oral health, and the results are comforting, as more than 45% of respondents agree that excessive sugar consumption can be a risk factor for children's oral health.

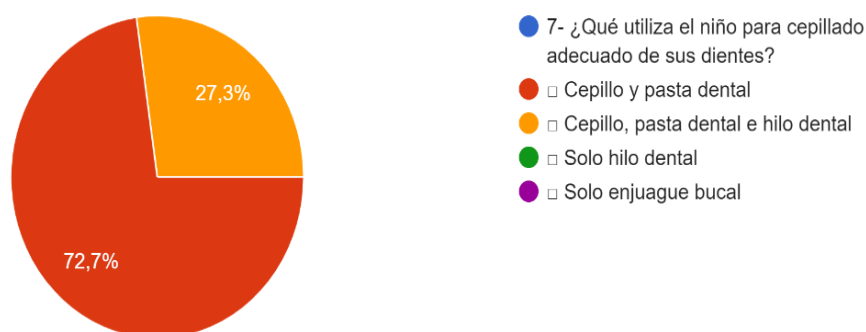
This finding is very important, as it shows that there is a growing awareness among participants about the negative impact that sugar can have on the oral health of children. This positive perception towards the risk of sugar consumption indicates that a considerable group of people are taking preventive actions within their homes to protect the oral health of their children.

The recognition that sugary products can affect children's oral health is an important step toward raising awareness about managing a balanced, healthy diet for dental care. A diet high in sugars can contribute to the development of cavities and other dental conditions, so avoiding or reducing consumption of sugary foods and drinks can be a key factor in maintaining a healthy mouth.

This result also highlights the relevance of education and information in promoting healthy habits. It is likely that outreach and awareness efforts about the importance of a balanced diet and its positive effects on oral health are having an impact on respondents' perception.

Despite this positive trend, it is essential to continue promoting oral health education and prevention. There may be a significant percentage of the population that is not yet fully aware of the risks associated with excessive sugar consumption and its impact on children's dental health.

**Question 6.** What does the child use for proper brushing of his teeth?



**Figure 6.** Proper brushing

Figure number 6 offers an interesting insight into the oral hygiene habits of the children who participated in the study. It was evident that more than 72% of the children surveyed use brush and toothpaste as part of their oral care routine. This is undoubtedly one of the best practices to remove bacterial plaque and maintain good dental health.

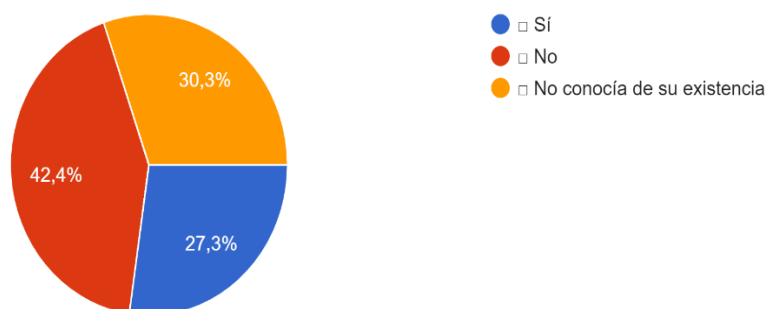
Regular toothbrushing is critical to preventing plaque buildup, which is a sticky film made up of bacteria and food debris that forms on the surface of teeth. If plaque is not removed properly, it can lead to tooth decay, gum disease and even bad breath.

Importantly, brushing alone does not remove plaque entirely, as there are areas in the mouth where the brush cannot easily reach, such as the interdental spaces. For this reason, it is favourable to note that a significant percentage of children, that is, 27%, have incorporated the use of dental floss into their oral hygiene routine.

As mentioned above, flossing is a highly beneficial practice, as it allows to remove food residues and plaque that accumulate between the teeth and in areas difficult to access for the toothbrush. By supplementing brushing with flossing, the effectiveness of cleaning is improved, thus reducing the risk of developing cavities and gum disease.

Instilling flossing from an early age is essential to establishing proper oral hygiene habits and promoting optimal dental health throughout life. Children who acquire this practice from a young age develop a greater awareness of the importance of taking care of their oral health, which can have a positive impact on their dental well-being as they grow.

**Question 7.** Has your child ever had sealant placed on his or her teeth?



**Figure 7.** Sealant placement

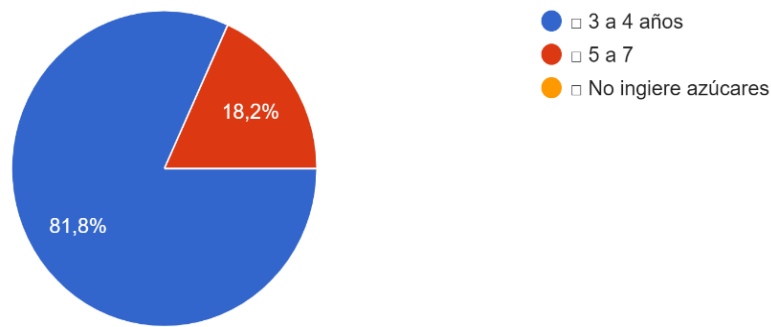
In the analysis of the results obtained, it is significantly highlighted that the vast majority of participating children do not have sealants in their molars, which places them in a more vulnerable situation to the appearance of caries. It is alarming to note that more than 42% of children have not received the application of dental sealants, which exposes them to a greater probability of developing caries up to three times faster than their peers who have been protected with this preventive measure.

It is pertinent to highlight that there is a significant percentage, corresponding to 30% of children, who said they did not know about dental sealants and their benefits. This finding suggests a lack of information and awareness about the importance of this dental protection technique in preventing caries. This misinformation may stem from the lack of dissemination of oral health programs or the need to implement educational strategies to sensitize both parents and children about the benefits and relevance of dental sealants.

On the other hand, it can be noted that 27% of children do have dental sealants, which means that they have undergone this application to protect their teeth from the action of bacteria, acids and food debris that could trigger cavities. Dental sealants consist of a thin layer of resin, which is applied to the grooves of the teeth, thus creating a protective barrier that decreases the risk of caries in these areas difficult to access for traditional brushing.

These results underline the importance of promoting and extending the application of dental sealants as an effective preventive measure to maintain optimal oral health in children. By increasing knowledge about sealants and their benefits, and by promoting their use in dental practice, caries in children can be significantly reduced.

**Question 8.** At what age did the child start eating sugar?



In relation to the last study carried out, results have been obtained that allow us to infer and determine that the infants under study have not been exposed to sucrose intake at an early age. In accordance with current health guidelines, it is recommended that the introduction of sugars into children's diets should take place from the age of two, in moderate proportions.

By virtue of the conclusions obtained, it is clear that the oral care provided to infants has been exercised with diligence and caution. This finding highlights the importance given to oral health in these early stages of life, and evidences the adoption of adequate preventive measures by caregivers and health professionals.

It is important to highlight that this finding contributes to the understanding and promotion of healthy eating habits in childhood, which constitute a fundamental factor for the maintenance of optimal oral and general health. Likewise, the results obtained in this study support the importance of education and the promotion of preventive strategies aimed at the community as a whole, in order to raise awareness about the need for a balanced diet and adequate oral hygiene from the early stages of life.

However, it should be noted that the results obtained in this study should be interpreted within the limits of the research carried out, taking into account possible biases and methodological limitations. Therefore, it is suggested that future research focus on expanding the sample and applying complementary methodologies, in order to consolidate and enrich the findings presented in this study.

This study gives us valuable insight into the importance of a balanced diet in childhood and its impact on the health and integral development of schoolchildren. The results obtained are a solid basis for the promotion of nutrition and health education programs in schools and communities, seeking to strengthen the preventive approach and promote healthy eating habits from an early age.

The findings of this study encourage us to continue working together with families, health professionals and the educational field to promote healthy and nutritious eating in schoolchildren, providing them with the necessary tools to grow up healthy, strong and with optimal physical and cognitive development <sup>(16-17)</sup>. Prevention through nutrition education is key to building a healthier and more resilient society.

It is essential to highlight the relevance of ongoing research in the field of dentistry and oral health. These findings provide a solid basis for future research and for the development of more effective prevention strategies to protect children's smiles and oral health from an early age <sup>(18-19-20)</sup>. In addition, it is essential to establish educational programs that raise awareness in the community about the importance of oral health and preventive practices that contribute to maintaining a healthy smile throughout life.

Some of the points to consider in relation to oral health and eating habits are the following:

1. Relationship between dietary pattern and prevalence of caries: It could be analyzed if there are specific dietary patterns in children who have higher rates of dental caries. For example, it is relevant to evaluate the frequent consumption of foods rich in sugars and fermentable carbohydrates, which are known to be risk factors for the development of caries.

2. Importance of oral hygiene: It is essential to explore how oral hygiene habits influence the prevalence of caries in this population. We could examine whether those children who have better oral hygiene, including proper brushing and flossing, have a lower incidence of caries.
3. Influence of family environment: Parental involvement in children's oral care is a crucial factor in developing good oral health habits. The relationship between parents' level of knowledge and awareness of the importance of oral health and the prevalence of caries in their children could be investigated.
4. Education and promotion of oral health: The results obtained in this research could have significant implications for the promotion of oral health in children. It would be interesting to discuss how educational and prevention programs could be implemented in the educational unit and the community to reduce the incidence of caries and encourage healthy oral care habits.
5. Future research and actions: Based on the findings of this study, future research could be proposed to delve into specific aspects of the relationship between food and oral health in childhood. In addition, it would be relevant to design effective interventions to improve the oral health of children in this population.

#### 4. Conclusion

Based on the data collected through the surveys, we conclude that in the population evaluated, parents consider that the food provided to their children is in a range ranging from good to excellent, however, they do not rate the nutritional content of such food. Likewise, we observe that oral hygiene and care is mostly done in a traditional way, that is, through the use of toothpaste and toothbrush, carried out in the vast majority of cases twice a day, and in some very exceptional cases, dental floss is used additionally.

Due to these oral hygiene practices and the regular consumption of foods with significant sugar content from an early age, we have found that approximately three-quarters of the population have experienced episodes of caries in the last year. This suggests that there is an association between eating habits and oral hygiene and the prevalence of caries in this child population.

An interesting and noteworthy fact is the widespread ignorance about the use of dental sealants as a protective measure for teeth. Dental sealants are an effective tool for preventing tooth decay in the grooves and fissures of tooth surfaces. However, it is evident that this preventive resource has not been adequately disseminated among parents, which could partly explain the high incidence of caries in the children evaluated.

This situation highlights the importance of carrying out educational campaigns aimed at both parents and children themselves, in order to promote greater awareness of the relationship between food, oral hygiene and oral health in general. It is essential that parents understand the importance of a balanced, low-sugar diet for their child's dental well-being, as well as the need to implement additional oral hygiene measures, such as proper flossing and consideration of the use of dental sealants.

Establishing educational and prevention programs in educational units and communities could have a significant impact on reducing the incidence of caries in the child population. In addition, additional research could be carried out to further explore the relationship between dietary habits, oral hygiene practices and the prevalence of caries in different contexts and populations, in order to obtain a more complete picture of the factors involved in this problem.

#### References:

1. Barrientos Sánchez S, Velosa J, Odontologist P, En M, Rodríguez A, Bacteriologist C, et al. Prevalence of recurrent herpes labialis in population of 18-30 years of age in Bogota, Colombia. Available in: <https://www.redalyc.org/pdf/2312/231242326020.pdf>
2. Silva de Paéz B, Chimenos Küstner E. Herpes simplex virus type 1 (HSV-1) infection. Arch Odontol Estomatol [Internet]. 2001 [cited 20 July 2023]; Available in: <https://diposit.ub.edu/dspace/handle/2445/161937>
3. Vega YGC, del Rocío Sánchez Pérez L, Abarca LVR. Expert system for comprehensive reparation and affectation to the life project in the Organic Integral Criminal Code. University and Society [Internet]. 2021 [cited 2023 Jul 14];13(S1):125–33. Available from: <https://rus.ucf.edu/cu/index.php/rus/article/view/2017>

4. Vega YGC, WAC Street, Giler SAM. Analysis of the legal obligation to declare protected areas, forests in Santo Domingo, with the use of diffuse cognitive maps. University and Society [Internet]. 2021 [cited 2023 Jul 14];13(S1):134–45. Available from: <https://rus.ucf.edu.cu/index.php/rus/article/view/2018>
5. Armour M, Semprini A, Ee C, MacCullagh L, Shortt N. Efficacy of a topical herbal and mineral formulation (Dynamiclear) for the treatment of herpes simplex labialis in the community setting: study protocol for a randomised, double-blind placebo-controlled trial. BMJ Open [Internet]. 2020 [cited 20 July 2023];10(1):E031876. Available in: <https://bmjopen.bmj.com/content/10/1/e031876.abstract>
6. Lindenmüller IH, Fistarol SK. Canker sores and aphthous diseases of the oral cavity. Quintessence [Internet]. 2012 [cited 20 July 2023];25(1):32–40. Available in: <https://dialnet.unirioja.es/servlet/articulo?codigo=3859780>
7. Polansky H, Javaherian A, Itzkovitz E. Clinical trial of herbal treatment Gene-Eden-VIR/Novirin in oral herpes. J evid based integr med [Internet]. 2018;23:2515690X1880626. Available in: <http://dx.doi.org/10.1177/2515690X18806269>
8. Researchgate.net. [cited 20 July 2023]. Available in: [https://www.researchgate.net/profile/Luca-Giannetti/publication/322526986\\_Recurrent\\_aphtous\\_stomatitis/links/5b9b8d53a6fdcc3cb5435d4/Recurrent-aphtous-stomatitis.pdf](https://www.researchgate.net/profile/Luca-Giannetti/publication/322526986_Recurrent_aphtous_stomatitis/links/5b9b8d53a6fdcc3cb5435d4/Recurrent-aphtous-stomatitis.pdf)
9. Ortiz BET, Del Pilar Araujo Escobar E, Andachi JWS. Legal analysis of the abandonment of causes typified in the General Organic Code of Processes, based on sets of numbers of 2-tuples. University and Society [Internet]. 2021 [cited 2023 Jul 14];13(S1):146–56. Available from: <https://rus.ucf.edu.cu/index.php/rus/article/view/2019>
10. Muñoz DAF. Study for the packaging and artisanal production of the chocolate drink from Ambato. University and Society [Internet]. 2021 [cited 2023 Jul 14];13(S1):157–64. Available from: <https://rus.ucf.edu.cu/index.php/rus/article/view/2020>
11. Piédrola Gil PREVENTIVE MEDICINE AND PUBLIC HEALTH [Internet]. Libreriaao.com. [cited 20 July 2023]. Available in: <https://libreriaao.com/wp-content/uploads/2020/12/Indice.pdf>
12. Misra N, Maiti D, Misra P, Singh AK. 940 nm diode laser therapy in management of recurrent aphthous ulcer. BMJ Case Rep [Internet]. 2013;2013(apr17 1):bcr2012008489–bcr2012008489. Available in: <https://revistas.unimagdalena.edu.co/index.php/duazary/article/download/4266/3191/13648>
13. Bencini AC, Bencini CA, Strada V, Florencia Soldavini M, Bruno GM, Cordeu MF, et al. Eosinophilic ulcer of oral mucosa [Internet]. Isciii.es. [cited 20 July 2023]. Available in: <https://scielo.isciii.es/pdf/maxi/v31n4/caso3.pdf>
14. Caicedo JO, Moina ÁP, Tite ST, Cognitive AN, Caicedo Rodríguez JO, Paúl Á, et al. Neutrosophic cognitive maps for the analysis of the factors in the proper diagnosis of conversion disorder [Internet]. Unm.edu. [cited 14 July 2023]. Available in: <http://fs.unm.edu/NSS/36-NeutrosophicCognitiveMaps.pdf>
15. Armijos FM, Castillo JJ, Armijos JF, Del C, Zurita RB, Marcelo F, et al. Treatment alternatives to gingival hyperpigmentation using neutrosophic correlation coefficients [Internet]. Unm.edu. [cited 14 July 2023]. Available in: <http://fs.unm.edu/NSS/37-TreatmentAlternativesGingival.pdf>
16. Benites RM, Morales JD, Sánchez JE, Neutrosophic S, David J, Cobos M, et al. Neutrosophic linguistic scale for the assessment of knowledge of natural and traditional medicine in dental students [Internet]. Unm.edu. [cited 14 July 2023]. Available in: <http://fs.unm.edu/NSS/38-NeutrosophicLinguisticScale.pdf>
17. Comparative E, the DE. COMPARATIVE STUDY OF THE EFFICACY OF SEVERAL TOPICAL TREATMENTS OF RECURRENT APHTHOUS STOMATITIS [Internet]. Ugr.es. [cited 20 July 2023]. Available in: <https://digibug.ugr.es/bitstream/handle/10481/1663/16910114.pdf?sequence=1&isAllowed=y>
18. Parra HC, Moreno NL, Rivera G, Estupiñán J. Factors involved in the decision for cardiac catheterization in octogenarian patients with Acute Coronary Syndrome. 2011 [cited 15 July 2023]; Available in: <https://repository.urosario.edu.co/items/9ae9f769-a3e5-46e2-8bf7-890b9df5841c>
19. Ricardo JE, Hernández NB, Zumba GR, Márquez MCV, Balla BWO. The ASSESSMENT CENTER FOR THE EVALUATION OF THE COMPETENCES ACQUIRED BY HIGHER LEVEL STUDENTS. Oper Research [Internet]. 2019 [cited 15 July 2023];40(5). Available in: <https://revistas.uh.cu/invoperacional/article/view/517>
20. Crimi S, Fiorillo L, Bianchi A, D'Amico C, Amoroso G, Gorassini F, et al. Herpes virus, oral clinical signs and QoL: Systematic review of recent data. Viruses [Internet]. 2019 [cited 20 July 2023];11(5):463. Available in: <https://www.mdpi.com/1999-4915/11/5/463>