

Impact of an educational intervention on oral health in children aged 8 to 11 years

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Abstract

Objective: The purpose of this study was to assess the oral health knowledge and practices of oral hygiene before and after educational interventions among students between the ages 8 and 11, at the “José María Velasco Ibarra” school in the city of Cuenca, Ecuador. Good oral hygiene practices are achieved through health education, which should start in early childhood and should be reinforced at school, because in their early years children will adopt appropriate healthful habits that will last throughout their lives.

Materials and methods: This is a quasi-experimental study whose sample is made up of 36 students aged 8 to 11 years from the “José María Velasco Ibarra” school in the city of Cuenca, Ecuador. To develop the research project, the questionnaire of the Ministry of Public Health was applied: “Dental knowledge, attitudes and practices (KAP) surveys, aimed towards schoolchildren”, as well as the Löe & Silness index.

Results: When we performed the Löe & Silness plaque index the following results were reported: good hygiene 13.8%, regular hygiene 61.1% and poor hygiene 25%. After the educational intervention the following results were obtained: children with good hygiene 72.2%, regular hygiene 22.2% and poor hygiene 5.6%.

Conclusion: Educational interventions have a positive effect on students’ oral hygiene as plaque reduction is achieved as children improve their oral health knowledge.

Keywords: Oral Health; Oral Hygiene; Education; Children

1. Introduction

Among the oral diseases that prevail in preschool-age children worldwide are dental caries, which affects their quality of life [1] and periodontal disease [2]. Caries is a disease considered non-communicable from the classical point of view of transmission [1]. There is an imbalance between the microorganisms of the oral microbiota, and in addition, also localized tooth demineralization occurs as a result of poor oral hygiene, a diet with a low level of nutrients, little knowledge about prevention measures, and limited access to health services [3].

These diseases can be prevented through good hygiene practices, which are obtained through health education, which should start in early childhood and should be reinforced at school. Because, in their early years children will adopt

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appropriate healthful habits that they will last throughout your life [4] [5]. Furthermore, the prevention of these diseases is less complicated and expensive compared to what a treatment implies [6].

One of the objectives of prevention is to avoid causing pain and infection, which can be due to the progression of the disease. The progression of the disease affects the performance of daily activities [7]. Children with poor oral health are more likely to have more days of inactivity, including school non-attendance, compared to those without. Each year, there is a loss of more than 50 million school hours due to oral diseases [8].

Oral health has an impact on general health; therefore, it is essential that the child acquires knowledge and a good attitude regarding oral hygiene. It is for this reason that oral health education should be reinforced in educational institutions, considering that children, by obtaining knowledge of hygiene and oral health at an early age, could acquire healthful habits for their entire lives; using relevant educational strategies [9] [6]. This study assesses the knowledge and practices of oral hygiene before and after an educational intervention in students aged 8 to 11, at the “José María Velasco Ibarra” school in the city of Cuenca, Ecuador.

2. Material and methods

The present study is of a quasi-experimental type in which the 8 to 11-year-old students with regular attendance at the “José María Velasco Ibarra” school have been considered as a universe with a random sample of 36 students of both sexes, from a universe of 108, the inclusion criteria are: signature and acceptance of informed consent and assent based on the bioethical criteria of the Helsinki document; bear in mind the permanent teeth 16, 21, 24, 36, 41 and 44 and of the deciduous teeth: 5.5, 6.1, 7.5, 8.1, 8.4 and the exclusion criteria are: children with fixed orthodontics.

To develop the research project, the questionnaire of the Ministry of Public Health was applied: “Dental knowledge, attitudes, and practices (KAP) surveys, aimed towards schoolchildren” [10]. A clinical dental examination is then carried out to evaluate oral hygiene practice according to the Loe & Silness biofilm index. Inspecting the surfaces of the mentioned pieces to determine the different degrees of bacterial plaque accumulation, using a Hu-friedy periodontal probe (CP-11) with visual inspection with a flat mirror number 5.

The clinical criteria for the Loe & Silness index were: grade 0 no plaque is observed, grade 1 plaque is visible only when rubbing with the probe, grade 2 there is dental plaque with the naked eye, grade 3 excessive accumulation of dental plaque even in the interproximal area, there may also be calculus [11].

The educational intervention includes lectures supported by audiovisual material on oral health and prevention of oral diseases and tutoring of tooth brushing. One week later, without any prior notice, an evaluation is carried out on the above. Where oral hygiene was assessed according to the following table [12].

Table 1 Oral hygiene scores in the children of the José María Velasco Ibarra School that were used in the thesis based on the bibliography 12

ORAL HYGIENE SCORES	
	Interpretation
EXCELLENT	0
GOOD	0.1 – 1
REGULAR	1.1 – 2
POOR	2.1 – 3

Source: Survey database. Prepared by: authors

With the results of levels of knowledge and clinical data of bacterial plaque obtained in the surveys, a database is prepared using Microsoft Excel for data cleaning and tabulation. Then it is exported to the SPSS statistical program, where the corresponding statistical analysis is carried out.

3. Results

During the first survey, it is reported that 52% of children do not have knowledge about the definition of dental caries and that 41.7% know about the various causes of this disease.

After the intervention, a second survey takes place and shows the following result: 72.2% of the children answer correctly about the definition and causes of dental caries, presenting a significant increase in their level of knowledge ($p = 0.05$ and $p = 0.005$ respectively).

Table 2 Knowledge of dental caries and its pathogenesis in children of the “José María Velasco Ibarra School”

		KNOWLEDGE - DENTAL CARIES			PATHOGENY - DENTAL CARIES		
		Nº Cases	Porcentaje	P	Nº Cases	Porcentaje	P
BEFORE	Appropriate	17	47.2%	0.05	15	41.7%	0.005
	Inadequate	19	52.8%		21	58.3%	
AFTER	Appropriate	26	72.2%		27	75%	
	Inadequate	10	27.8%		9	25%	
Total children 36							

Source: Survey database. Prepared by: authors

Based on the surveys, it is reported that 13.9% of the students understand the meaning of bacterial plaque and after giving lectures on oral health, it is determined that knowledge increases to 66.7% ($p = 0.001$). In addition, it is determined that 33.3% of the children know about the frequency with which they should attend the dentist and after the lectures there is achieved an increase to 75% ($p = 0.001$). Regarding the cariogenic diet, it is reported that 58% of students know at least two cariogenic foods and 63.9% understand the frequency with which these foods should be consumed to prevent cavities. An increase of 83.3% and 66.7% respectively is the result of the lectures ($p = 0.025$ and $p = 0.90$ respectively). When evaluating the knowledge about the relationship between sweets and oral health, it is found that 63.3% understand this relationship, and it increases to 75% ($p = 0.50$) after providing additional information in the lectures. The results of the research show that 19.4% answer correctly about bleeding gums, and after the lectures the percentage rises to 80.6% ($p = 0.001$). 88.9% show appropriate knowledge about dental cleaning, and thanks to the lectures, 100% of children have the knowledge ($p = 0.5$). Regarding the use of dental floss, 55.6% present a favorable response, after motivation, 91.7% is reached ($p = 0.001$). Relating to the knowledge about the importance of oral hygiene, a positive result of 47.2% is found, after the intervention, greater awareness is obtained about the importance of oral hygiene, achieving that 94.4% ($p = 0.001$) of the children understand its importance.

According to the Löe & Silness plaque index, the following results are reported: good hygiene 13.8%, regular hygiene 61.1% and poor hygiene 25%.

The educational intervention has a positive impact on the oral hygiene of the students and the following results are reported: children with good hygiene 72.2%, regular hygiene 22.2% and poor hygiene 5.6% ($p < 0.000003$).

Table 3 Löe & Silness index

LOE & SILNESS INDEX				
	BEFORE		AFTER	
	Nº Cases	Percentage	Nº Cases	Percentage
GOOD	5	13.88%	26	72.20%
REGULAR	22	61.11 %	8	22.20%
POOR	9	25 %	2	5.60%
Total children 36	Chi=25.5		df=2	P=0.000003

Source: Survey database. Prepared by: authors

4. Discussion

Dental plaque is the main cause of tooth decay and periodontal disease [13]. According to the WHO, between 60% and 90% of children have dental caries, with a higher incidence in Asian and Latin American countries [14]. These diseases can be prevented with education programs whose objective is to transmit knowledge so that people maintain their health [15].

The present study allows us to evaluate the positive effects of an educational intervention, as reported in the study by Sadana Gunmeen et al. [16] that showed a decrease in plaque after the participants acquire better knowledge about dental health [17].

According to the research of Tamara Pawlaczyk-Kamieńska et al. [5] children with poor and regular oral hygiene are more likely to present bleeding on probing, which is why it is proposed the need to promote health education in order [5] to achieve changes in behaviors. This fact is verified in the study by Eden, Ece et al. [18] in which improvements in children's knowledge and behavior about oral health and plaque control are reported, after applying two school oral health education programs (OHE) [18].

The study by Kyu Kyu Swe et al. (2021) [19] ratifies the efficacy of interactive talks in addition to demonstration and supervision of brushing methods with a statistically significant effect on total oral health knowledge and behavior scores among school-age children [19].

At the end of this study, a considerable increase in children with good oral hygiene is reported, as indicated in the study by Ana María Nicot et al. [20]. In which it is achieved an increase in knowledge through the motivation imparted through health programs.

These results show the efficacy of the educational intervention accompanied by a brushing technique practice, which according to Ahire et al. [20] is much more effective if it is done through a clinical demonstration.

5. Conclusion

Educational interventions have a positive effect on students' oral hygiene as plaque reduction is achieved as children expand their oral health knowledge.

Compliance with ethical standards

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Disclosure of conflict of interest

There are no conflicts of interest in this work.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

Ethical approval statement

This work was approved by the research direction by the DIFO (IRB).

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