

# **Oral hygiene index in 12-year-old schoolchildren of the Checa parish in Canton Cuenca, Province of Azuay, Ecuador, 2016**

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## **Abstract**

**Objective:** To determine the Oral Hygiene Index in schoolchildren aged 12, from the Checa parish of Canton Cuenca, Province of Azuay, Ecuador, 2016. **Materials and methods:** Descriptive cross-sectional study; the observational technique was applied to determine the state of the epidemiological profile. The indicators were obtained through a structured survey. **Results:** In the 109 schoolchildren aged 12 surveyed, there was a slight predominance of females (58%) over males (42%). In addition, 47.7% presented good oral hygiene, 36.7% excellent oral hygiene, 14.7% poor oral hygiene and 0.9% bad oral hygiene, therefore, over half the students present a good or excellent OHI. **Conclusion:** Most schoolchildren have good oral hygiene, and there are no significant variations in terms of sex.

**Keywords:** oral hygiene, dental plaque, Oral Hygiene Index, schoolchildren.

## **Resumen**

**Objetivo:** Determinar el Índice de Higiene Oral en escolares de 12 años, de la Parroquia Checa del Cantón Cuenca, Provincia del Azuay – Ecuador, 2016. **Materiales y métodos:** Estudio descriptivo de corte transversal; la técnica empleada para determinar el estado del perfil epidemiológico fue observacional. Los indicadores se lograron obtener por una encuesta estructurada. **Resultados:** De los 109 escolares de 12 años encuestados se observó un ligero predominio del sexo femenino (58%) sobre el sexo masculino (42%). Además, se determinó que el 47,7% presenta una buena higiene oral, el 36,7% una higiene oral excelente, el 14,7% una higiene oral regular y el 0,9% una mala higiene oral, dando como resultado que más de la mitad de los escolares presentan un IHO bueno y excelente. **Conclusión:** Existe un mayor número de escolares con higiene oral buena sin encontrar variación significativa en cuanto al sexo masculino con el femenino.

**Palabras clave:** Higiene oral, placa dental, índice de higiene oral, escolares

## **Resumo**

**Objetivo:** Determinar o Índice de Higiene Oral em escolares de 12 anos, da Vila Checa do cidade de Cuenca, Estado de Azuay - Equador, 2016. **Materiais e métodos:** Estudo descritivo transversal; A técnica utilizada para determinar o status do perfil epidemiológico foi observacional. Os indicadores foram obtidos por meio de uma

pesquisa estruturada. **Resultados:** Dos 109 escolares de 12 anos pesquisados, observou-se discreto predomínio do sexo feminino (58%) em relação ao sexo masculino (42%). Além disso, determinou-se que 47,7% apresentavam boa higiene bucal, 36,7% excelente higiene bucal, 14,7% higiene bucal regular e 0,9% má higiene bucal, resultando em mais da metade dos estudantes apresentam um bom e excelente IHO. **Conclusão:** Existe um número maior de escolares com boa higiene bucal sem encontrar variação significativa no sexo masculino com o feminino.

**Palavras-chave:** Higiene bucal, placa dentária, índice de higiene bucal, escolares.

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1. Conception and design of study
  2. Acquisition of data
  3. Data analysis
  4. Discussion of results
  5. Drafting of the manuscript
  6. Approval of the final version of the manuscript
- JM JL has contributed in: 1, 2, 3, 6
  - ACVP has contributed in: 1, 2
  - FKSF has contributed in: 1, 3, 4, 5, 6

## **Introduction**

Education on oral health is one of the fundamental tasks of public health as oral diseases such as caries and periodontal disease have the highest incidence and prevalence worldwide<sup>(1)</sup>. According to the World Health Organization, good oral health is essential for good health and good quality of life <sup>(2)</sup>.

In addition, it states that a lack of oral hygiene and poor nutrition, among others, are risk factors for oral diseases <sup>(3)</sup>.

School age is a critical stage when it comes to oral health, which is why the WHO has established age 12 as the global age for caries surveillance and official assessment of the disease <sup>(4)</sup>.

Poor oral hygiene leads to the accumulation of pathogenic biofilm <sup>(5-6)</sup>, which is one of the leading causes of caries and periodontal disease <sup>(7)</sup>. If the biofilm is not eliminated, it can even lead to tooth loss. Therefore, patients need to attend periodical checkups and receive adequate treatment whenever necessary <sup>(8)</sup>.

All this considered, there is little information about the oral hygiene index in 12-year-old schoolchildren, so this research served as a means to collect information to contribute to subsequent epidemiological studies while gathering data for the health system as well. Oral hygiene, the variable used for this study, is understood as the implementation of an effective method to remove remnants of food, which prevents unpleasant odors and future diseases. This was measured using the Greene and Vermillion Simplified Oral Hygiene Index <sup>(1,9)</sup>. The study aimed to determine the Oral Hygiene Index in schoolchildren aged 12, from the Checa parish of Canton Cuenca, Province of Azuay, Ecuador, 2016.


### **Materials and methods**

This is a cross-sectional descriptive and observational study. It was conducted in the schools of the Checa parish of Canton Cuenca, Province of Azuay. We used the school chair for the examination, with the mouth of the student facing a source of light, which in this case was natural light. A total of 109 schoolchildren who met the inclusion criteria were included: 12 years of age or to turn 12 before 31 December 2016, and to be enrolled in an educational center of the Checa parish. The data was collected through May to July 2016 and was registered in the epidemiological record sheet of the Catholic University of Cuenca, which includes five sections. The first includes general patient information, the second, the Oral Hygiene Index data

(we used a dental probe in this phase), the third one the DMFT Caries Index, the fourth one Russel's Periodontal Disease Index, and the fifth one is for malocclusions; the data was collected before the schoolchildren's recess time. We used the first and second part of the epidemiological record sheet, which include Greene and Vermillion's simplified Oral Hygiene Index consisting of:

Soft plaque deposits analysis:

Code 0: No deposits or pigmentation 

Code 1: Deposits covering less than one third or pigmentation 

Code 2: Deposits covering over 1/3, but less than 2/3

Code 3: Deposits covering over 2/3 of the tooth surface

Dental calculus analysis:

Code 0: No calculus present

Code 1: Calculus covering less than 1/3 of the tooth surface

Code 2: Calculus covering over 1/3, but less than 2/3 of the tooth surface

Code 3: Calculus covering over 2/3 of the tooth surface

Once every schoolchild's teeth were analyzed to obtain the simplified oral hygiene index, the values were added and divided among the number of teeth examined. This was done for the analysis of both soft and calcified plaque. After calculating the result, we determined the clinical level of oral hygiene:

- 0.0= Excellent

- 1.2= Good
- 1.3 - 3.0= Poor
- 3.1 - 6.0= Bad

Source: Mera <sup>(10)</sup>.

The data collection involved the randomized selection and calibration of four observers, who were calibrated by an expert professor to ensure consistency between the data presented by the expert and the observers with a kappa value >80%, and the data was subsequently entered into the Epi Info 7.2 system. The information entered passed a quality test control.

The sample size was obtained using a formula that considers 5% error and 95% reliability <sup>(11)</sup>. The data was then analyzed using the Chi-square statistical test.

To preserve patient autonomy, we requested parents to sign an informed consent, and the schoolchildren included in the study agreed to it.

## **Results**

This study was conducted at the Checa parish of Cuenca Canton. The results indicate a sample distribution of 109 schoolchildren aged 12 with a slight predominance of females (58%) over males (42%).

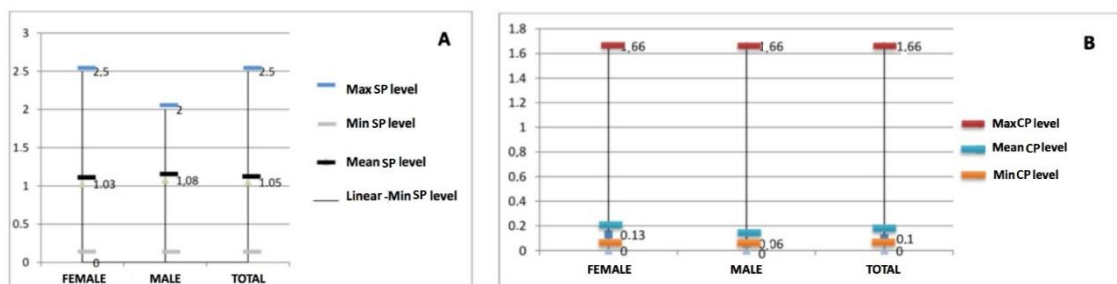
The level of soft plaque in schoolchildren showed an average of 1.03

for females and 1.08 for males; the level of calculus showed an average of 0.06 for males and 0.13 for females.

(Figure 1)

Figure 1. Soft Plaque Level.

**B** Calculus Level



The simplified oral hygiene index showed that the schoolchildren under study had good oral hygiene (0.63) on average. However, we observed outliers with a poor oral hygiene index in males of a maximum value of 2 and a bad oral hygiene index in females of a maximum value of 4 (table 1).

We observed that on average, there is no significant difference in the oral hygiene index between both sexes, although we found there are some girls with bad oral hygiene (figure 2).

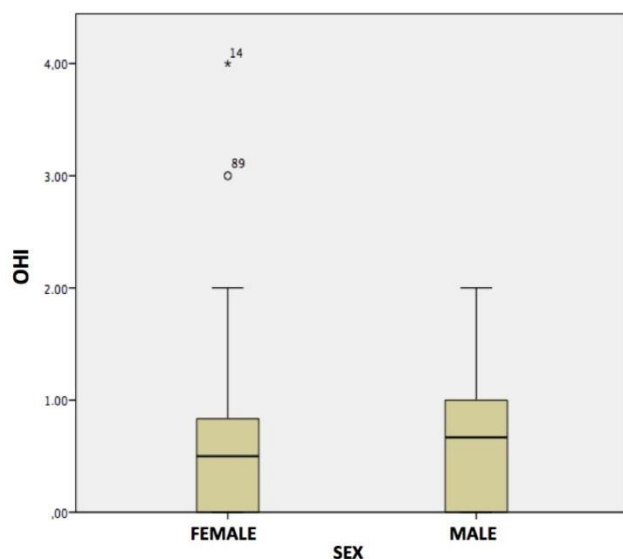


Table 1. Simplified Oral Hygiene Index

S-OHI	MALE	FEMALE	TOTAL
<b>VALID</b>	46	63	109
<b>TEETH LOST</b>	0	0	0
<b>MEAN</b>	0.7029	0.5899	0.6376
<b>MEDIAN</b>	0.6667	0.5	0.5
<b>STANDARD DEVIATION</b>	0.68576	0.7554	0.72572
<b>MINIMUM</b>	0	0	0
<b>MAXIMUM</b>	2	4	4

S-OHI. Simplified Oral Hygiene Index

Figure 2. Simplified Oral Hygiene Index by sex



In terms of oral hygiene, on average, schoolchildren had a similar level of oral hygiene between both sexes without a significant difference between them (Table 2). Both females and males had a good level of oral hygiene (47.7%), followed by excellent oral hygiene (36.7%), and in the case of females, 0.9% had bad oral

hygiene (Table 3).

*Table 2. Level of Oral Hygiene Index by sex*

<b>LEVEL S-OHI</b>	<b>MALE</b>	<b>FEMALE</b>	<b>TOTAL</b>
<b>VALID</b>	46	63	109
<b>TEETH LOST</b>	0	0	0
<b>MEAN</b>	0.8478	0.7619	0.7982
<b>MEDIAN</b>	1	1	1
<b>STANDARD DEVIATION</b>	0.7293	0.71198	0.71725
<b>MINIMUM</b>	0	0	0
<b>MAXIMUM</b>	2	3	3

*Table 3. Oral Hygiene Level*

<b>LEVEL OHI</b>	<b>MALE %</b>	<b>FEMALE %</b>	<b>TOTAL %</b>
<b>Excellent</b>	34.8	38.1	36.7
<b>Good</b>	45.7	49.2	47.7
<b>Poor</b>	19.6	11.1	14.7
<b>Bad</b>	0	1.6	0.9
<b>Total</b>	100	100	100

## **Discussion**

This study was conducted in the Educational Units of the Checa parish of the city of Cuenca in 2016, with a sample of 109 12-year-old schoolchildren, comprised of 58% females and 42% males.

The results showed that most of the participants had good oral hygiene levels at 47.7%, followed by excellent oral hygiene (36.7%), contrasting with fewer schoolchildren who showed poor and bad oral hygiene, both amounting to 15.6% of the sample. This data is similar

to the results shown by Gómez et al. <sup>(1)</sup> in their study at Universidad Veracruzana, Mexico, which determined good oral hygiene levels amounting to 81%, followed by poor hygiene at 17.4% and bad oral hygiene at 1.02% of the total population of 11-year-olds under study. They found no significant variation according to sex. However, the study conducted by Carrasco <sup>(12)</sup> among schoolchildren aged 7 to 13 showed a bad oral hygiene index. This is not consistent with the study conducted at the Checa parish given the difference in age groups involved in each study.

To identify the oral hygiene index, we analyzed the soft plaque and calculus index. In the case of soft plaque, we observed an average of 1.03 and 1.08 for females and males, respectively. This differs from the study conducted by Lahoud et al. <sup>(13)</sup>, who studied the prevalence of bacterial plaque, caries and malocclusions in 300 schoolchildren of both sexes, aged from 6 to 14. They found a soft plaque index of 2, which is not consistent with this study. This could be explained by sampling differences between the two studies.

The simplified Oral Hygiene Index in each institution showed that the level of oral hygiene in the community is good. This differs from the results of Pulido et al. <sup>(14)</sup>, who examined 392 high school students aged 12 to 14 in Cartagena, Colombia for periodontal disease and oral hygiene indicators; their results show poor oral hygiene.

Ibarra-Paredes et al. studied 12-year-old schoolchildren in El Vecino

parish in Cuenca-Ecuador, and observed that a level of good oral hygiene prevails with 61.62%, and they also indicated that the level of bad oral hygiene presents the lowest percentage in schoolchildren at 0.54%, which is consistent with this study, where the level of good oral hygiene prevails <sup>(15)</sup>.

## **Conclusions**

The Simplified Oral Hygiene Index in 12-year-old schoolchildren in the Checa Parish of Cuenca Canton in 2016 was 0.63, which corresponds to *Good* based on the Greene and Vermillion scale; there were no differences between the sexes. However, future studies should consider collecting similar samples for each sex so that they are comparable.

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