



Oral Health impact in the life quality of people in Cotopaxi, Ecuador

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ABSTRACT

Introduction: oral health significantly influences people's quality of life, especially considering that it is the individual and subjective evaluation of personal conditions in different aspects, particularly in contexts with limited access to treatments. Oral pathologies are prevalent and affect all ages, with tooth loss being an aggravating factor that negatively impacts the active working population.

Objective: to evaluate the impact of oral health on the quality of life of adults.

Methods: the study had an observational, analytical, and cross-sectional design. This design was justified by the need to assess the association between the impact of oral health and edentulism in an adult population, without direct intervention on participants. The research was conducted in the parish community, considering as the universe 7,933 adults between 18 and 65 years old, residents of rural and urban areas of a parish in Cotopaxi, in 2024.

Results: in Sigchos, the quality of life of the population showed some degree of impact in more than 90 % of cases. In rural areas, low impact predominated with 53,43 %, similarly in urban areas where it reached 75,56 %.

Conclusions: the close relationship between oral health and the quality of life of the adult population of Sigchos is evident. A significant disparity was observed in the impact of oral pathologies between rural and urban areas, with the rural population being the most affected.

Keywords: Quality of Life; Oral Health; Adult; Dentistry.

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INTRODUCTION

Quality of life is defined as the individual perception in aspects such as physical, mental, and emotional health, along with values and individual conditions.⁽¹⁾ This concept is measured through variables to determine positive or negative well-being, associating a higher quality of life with the healthy functioning of a healthy body, general well-being, and personal satisfaction.⁽²⁾

According to the World Health Organization (WHO), oral health is essential and inseparable from general health and quality of life, and it is estimated that oral diseases affect approximately 3.5 billion people worldwide,⁽¹⁾ representing a growing and often preventable public health problem that seriously affects the most vulnerable populations, being more frequent in countries with limited resources.⁽³⁾ These conditions range from mild discomfort to severe complications, altering people's ability to perform their daily activities,⁽⁴⁾ and affecting their integral well-being.⁽⁵⁾

Quality of life dimensions are categorized into three pillars: well-being, independence, and social participation.⁽⁶⁾ Well-being includes physical health, economic and emotional status,⁽⁷⁾ while independence encompasses personal development and the capacity for self-determination.⁽⁸⁾ Finally, social participation relates to interpersonal relationships, social inclusion, and respect for human and legal rights.⁽⁹⁾

Partial or total tooth loss is an irreversible condition that affects both the physical and emotional aspects, reducing the quality of life of those who suffer from it,⁽¹⁾ with its impact being more severe in rural populations and with complications that include masticatory difficulties, bone-level alterations, aesthetic alterations, temporomandibular joint alterations, and complications in swallowing.⁽¹⁰⁾

In Ecuador, oral pathologies are frequent, affecting a large part of the population. According to the 2018 STEPS survey, in which edentulism was evaluated using a scale of 0 teeth present, 1 to 9 teeth present, 10 to 19 teeth present, and >20 teeth present, 76,6 % of adults reported having at least 20 of their own teeth, although 6 % were in poor condition, while 22,6 % of respondents reported difficulty chewing food, and many experienced tension caused by dental problems,⁽¹¹⁾ revealing the urgency of addressing oral health beyond school policies.

Cotopaxi has a population of 470.210 inhabitants according to the 2022 Census, with the mestizo population predominating at 73,5 %, followed by the indigenous population at 23,7 %, ⁽¹²⁾ especially from the Panzaleo people. Within the territory, significant health limitations have been observed, especially in rural areas, where 72,11 % of basic needs remain unsatisfied.⁽¹³⁾ Furthermore, the canton of Sigchos in the aforementioned province reflects these difficulties, with a population of 18,460 inhabitants,⁽¹²⁾ and a predominantly young demographic structure, as well as barriers regarding access to health due to its location, transportation, availability of medical providers, and access to medical care, with 13 public health establishments in the canton, of which 9 (69,23 %) belong to the Ministry of Public Health (MSP) and 4 (3,77 %) to the Ecuadorian Social Security Institute (IESS).⁽¹⁴⁾

In this sense, the present research was proposed with the objective of evaluating the impact of oral health on the quality of life of adults in the parish of Sigchos of the aforementioned canton, to evidence the needs and develop linkage initiatives, focused on improving the well-being of the community.

METHODS

The study had an observational, analytical, and cross-sectional design. This design was justified by the need to assess the association between the impact on oral health and edentulism in an adult population, without direct intervention on participants.

The research was conducted in the parish community, considering as the universe 7,933 adults between 18 and 65 years old, residents in urban areas (1,947 people) and rural areas (5,986 people). The sample size was calculated with a confidence level of 95 % and a margin of error of 5 %, resulting in 367 participants, distributed in 90 from the urban area and 277 from the rural area. Adults within the indicated age range and residents in the parish were included; exclusion criteria were not specified in the document.

Data were collected through two main procedures:

- OHIP-14Ec questionnaire: validated instrument adapted to the Ecuadorian context, with a Cronbach's $\alpha > 0,75$. It consisted of 14 items on a Likert scale (0 = never, 4 = almost always), grouped into seven dimensions: functional limitation, pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. The total score ranged from 0 to 56 points, classified as low impact (0–18), moderate (19–37), and high (38–56).
- Clinical examination: a frontal flashlight and a sterile intraoral mirror were used to count present and lost teeth. Participants were classified into four categories: 0 teeth, 1–9 teeth, 10–19 teeth, and 20 or more teeth.

The main variables were the impact on oral health and edentulism, while the secondary variables corresponded to the specific dimensions of the questionnaire.

The collected data were recorded in a matrix in Microsoft Excel 2016. Subsequently, they were analyzed using descriptive and analytical statistics, applying the **Chi-square** test. Processing was performed with SPSS v.26 software. Strategies for handling missing data or biases were not specified. The study was approved by the Ethics Committee. Adult participation was voluntary. Likewise, data confidentiality was guaranteed.

RESULTS

In Sigchos, the quality of life of the population showed some degree of impact in more than 90 % of cases. Low impact predominated in the rural area with 53,43 %, similarly in the urban area where it reached 75,56 %, with no records of high impact in the latter, while the proportion of people without impact was minimal in both areas (6,81 % in total), as detailed in Table 1.

Table 1. Impact of oral health on quality of life in adults aged 18 to 65 years from rural and urban areas of Sigchos in 2024.

Impact	Rural Area n (%)	Urban Area n (%)	Total n (%)
No impact	18 (6,50)	7 (7,78)	25 (6,81)
Low Impact	148 (53,43)	68 (75,56)	216 (58,86)
Moderate Impact	83 (29,96)	15 (16,67)	98 (26,7)
High Impact	28 (10,11)	0 (0)	28 (7,63)
Total	277 (100)	90 (100)	367 (100)

Regarding tooth loss, most participants with 20 or more teeth present had a low impact on their quality of life, while those with 10 to 19 teeth showed greater moderate impact, and the Chi-square statistical test with a p-value of 0,000 confirmed a statistically significant relationship between tooth loss and the quality of life of participants, as described in Table 2.

Table 2. Relationship between the impact of oral health on quality of life and tooth loss.

Impact	0 teeth present n (%)	1 to 9 teeth present n (%)	10 to 19 teeth present n (%)	20 or more teeth present n (%)
No Impact	1 (12,5)	0 (0)	3 (4,29)	21 (7,92)
Low Impact	4 (50)	10 (41,67)	25 (35,71)	177 (66,79)
Moderate Impact	2 (25)	9 (37,5)	28 (40)	59 (22,26)
High Impact	1 (12,5)	5 (20,83)	14 (20)	8 (3,02)
Total	8 (100)	24 (100)	70 (100)	265 (100)
Pearson Chi-square: 48,473; degrees of freedom: 9; p-value 0,000				

Analysis by sex showed that low impact on quality of life predominated slightly in men (59,52 %) more than in women (58,29 %), while moderate impact (28,64 % vs. 24,64 %) and high impact (8,54 % vs. 6,55 %) were higher in women than in men. According to the Chi-square test, a p-value of 0,216 was observed, reflecting that there is no significant relationship between sex and quality of life of study participants.

Table 3. Relationship between the impact of oral health on quality of life, tooth loss, and residence (rural and urban).

Impact	0 teeth present		1 to 9 teeth present		10 to 19 teeth present		20 or more teeth present		Total	
	R	U	R	U	R	U	R	U	R	U
No impact	1	0	0	0	3	0	14	7	18	7
Low impact	4	0	5	5	19	6	12	57	14	68
Moderate impact	2	0	7	2	25	3	49	10	83	15
High impact	1	0	5	0	14	0	8	0	28	0
Total	8	0	1	7	61	9	19	74	27	90
U: Urban, Pearson Chi-square 4,181, degrees of freedom: 4; p 0,382 R: Rural, Pearson Chi-square 39,986, degrees of freedom: 9; p 0,000										

Low impact predominated in both areas of residence, with a predominance of women in the rural area and men in the urban area, while the Chi-square test did not report any statistical significance between residence, sex, and quality of life in the rural area, with a p-value of 0,521; however, there was statistical significance in the urban area, with a p-value of 0,043 as detailed in Table 4.

Table 4. Relationship between the impact of oral health on quality of life, sex, and residence (rural and urban).

Impact	Male		Female		Total	
	R	U	R	U	R	U
No impact	11	5	7	2	18	7
Low impact	66	34	82	34	148	68
Moderate impact	38	3	45	12	83	15
High impact	11	0	17	0	28	0
Total	126	42	151	48	277	90
U: Urban, Pearson Chi-square 6,314; degrees of freedom: 2; p-value 0,043 R: Rural, Pearson Chi-square 2,257; degrees of freedom: 3; p-value 0,521						

DISCUSSION

The impact of oral health on quality of life in adults belonging to rural and urban areas of Sigchos is compared, based on the Oral Health Impact Profile instrument adapted to the Ecuadorian context (OHIP-14Ec). It is highlighted that there is an impact of 93,5 % in the rural area and 92,22 % in the urban area, similar to what was found in a canton of Azuay, where there was an impact of 90 % of oral health on the quality of life of participants between 18 and 90 years old in rural areas⁽¹⁵⁾ and to what was identified in the adolescent population of Sigchos, with an impact of 89,45 %.⁽⁴⁾

In the present study, it was observed that low impact prevails, with 53,43 % in the rural area and 75,56 % in the urban area, reaching a total of 58,86 %, different from a study conducted in Sucre, Bolivia, where 84,2 % of participants between 15 and 85 years old presented a high impact on quality of life.⁽¹⁾ However, it is similar to what was identified in the adolescent population of Sigchos, where low impact predominated in 85,68 %, ⁽⁴⁾ this difference between studies conducted in Ecuador and Bolivia is justified by the cultural and socioeconomic differences present in each country, as well as the sites where the study was applied, since Sucre is one of the 2 capitals of Bolivia,⁽¹⁾ while Sigchos is a rural canton of Ecuador.⁽⁴⁾

The predominance of the female sex with 54,22 % was also observed, in the same way as other studies conducted in Quito with 58,8 %, ⁽¹⁶⁾ in Guayaquil with 57,55 %, ⁽¹⁷⁾ and in Macas with 63 %. ⁽¹⁸⁾ This is articulated with statistical data reflecting that in Ecuador the largest part of the population is represented by women,⁽¹¹⁾ according to the censuses of the years 2001, 2010, and 2022,⁽¹⁹⁾ as well as in other South American countries.⁽¹⁰⁾

Regarding the variable tooth loss, the study determined that 72,71 % of participants belonging to rural and urban areas had 20 or more teeth present in the mouth, which indicates a predominance of lower tooth loss, these results being similar to those of the 2018 STEPS survey at the national level in Ecuador, where it was recorded that 76,6 % of adults had 20 or more of their own teeth.⁽¹¹⁾

With reference to statistical analysis, the Chi-square test revealed the absence of statistical significance between the main variables; however, a significant relationship was observed between the number of teeth present in the mouth and quality of life, in general (p 0,000) and specifically in the rural area (p 0,000); being similar to what was found in southwest Florida in 2019, where a relationship was reported between the impact of oral health with teeth present and speech (p 0,024), as well as with functional disability with a p-value of 0,028.⁽²⁰⁾

Additionally, statistical significance was identified between the impact of oral health on quality of life, according to sex and urban area (p 0,043), while there was no significant relationship in the rural area (p 0,521), similar to what was reported in research conducted in Guayaquil, with p-value of 0,381⁽¹⁷⁾ and in the rural canton of Azuay with p-value of 0,389.⁽¹⁵⁾

On the other hand, in Paraguay it was identified in 2023 that, as the severity level of dental malocclusions increased, the oral health-related quality of life decreased significantly, in the dimensions psychological disability (p 0,028) and social disability with p 0,034.⁽¹⁰⁾ Likewise, in Mexico they reported in 2020 that oral mucosa diseases related to stress, such as lichen planus, have statistical significance in their impact on decreasing quality of life, especially in psychological discomfort (p 0,027), physical disability (p 0,004), and handicap with a p-value of 0,002.⁽²¹⁾ Similarly, in the adolescent population of Sigchos it was highlighted in 2024 that the psychological dimension presented statistical significance, between the variables sex, age, and dental care in the last 12 months.⁽⁴⁾ In this sense, one of the limitations of the present study was that the analysis of the impact on quality of life according to the different dimensions was not performed, especially the psychological one.

CONCLUSIONS

The present study highlights the close relationship between oral health and the quality of life of the adult population of Sigchos. A significant disparity was observed in the impact of oral pathologies between rural and urban areas, with the rural population being the most affected. In particular, a statistically significant association was found between tooth loss and decreased oral health-related quality of life, such that the fewer the number of teeth, the greater the level of impact on quality of life, especially in the rural area. On the other hand, in the urban area, a significant association was identified between sex and impact on quality of life, concluding that it is necessary to explore in greater depth the particularities and inequalities in oral health of each community.

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