Original article. Revista Multidisciplinaria Investigación Contemporánea.
Vol. 3 - No. 1, pp. 1 - 16. January-June, 2025. e-ISSN: 2960-8015

Prevalence of periodontal disease, malocclusion and pulp necrosis in the Nueva Vida community, Guayaquil, Ecuador

Prevalencia de enfermedad periodontal, maloclusión y necrosis pulpar en la comunidad Nueva Vida, Guayaquil, Ecuador

Karol Leonor Chávez Gónzález [1*], **Francisco Sánchez Almaraz** [2], **Luis Eduardo Santaella Palma** [3]

[1] **Universidad Politécnica Salesiana;** kchavezg@ups.edu.ec. Guayaquil, Ecuador.

[2] **Universidad Politécnica Salesiana;** fsanchez@ups.edu.ec. Guayaquil, Ecuador.

[3] **Universidad Politécnica Salesiana;** lsantaella@ups.edu.ec. Guayaquil, Ecuador.

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

How to cite:

Chávez Gónzález KL, Almaraz FS, Santaella Palma LE. Prevalence of periodontal disease, malocclusion and pulp necrosis in the Nueva Vida community, Guayaquil, Ecuador. REVMIC [Internet]. 2024 Oct. 22 [cited 2024 Oct. 22];3(1). Disponible en: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

Article information:

Received: 27-04-2024

Accepted: 06-09-2024

Published: 01-01-2025

Editor's note:

REDLIC remains neutral with respect to jurisdictional claims in published messages and institutional affiliations.

Publisher:

Red Editorial Latinoamericana de Investigación Contemporánea (REDLIC) www.editorialredlic.com

Sources of financing:

The research was carried out with own resources.

Conflicts of interest:

No conflicts of interest.

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

Abstract

Introduction: Periodontal disease, dental fluorosis and pulp necrosis are common clinical conditions in the dental context. Objective: to determine the prevalence of periodontal disease, malocclusion, dental fluorosis and pulp necrosis. **Methodology:** quantitative, observational and cross-sectional study, applying judgmental sampling, which included the 29 patients who met the inclusion criteria in the study and attended the dental care day developed in the Nueva Vida community, Guayaquil, Ecuador; by the Salesian Polytechnic University, María Auxiliadora Campus, in 2023. **Results:** a) prevalence of periodontal disease: (79.31%); b) prevalence of malocclusion (82.76%); c) prevalence of dental fluorosis (44.82%); d) prevalence of pulp necrosis (6.89%). Conclusions: Periodontal disease and malocclusion were predominant in the age group under 18 years and in the female sex. Dental fluorosis was predominant in males and under 18 years of age. Pulp necrosis occurred in the age group under 18 years, with no predominance by sex. No statistically significant association was found between periodontal disease, malocclusion, fluorosis and pulp necrosis with age group and sex.

Keywords: dentistry, epidemiology, age, sex, disease.

Resumen

Introducción: La enfermedad periodontal, fluorosis dental y necrosis pulpar son condiciones clínicas frecuentes en el contexto odontológico. Objetivo: determinar la prevalencia de la enfermedad periodontal, maloclusión, fluorosis dental y necrosis pulpar. **Metodología:** Estudio cuantitativo, observacional, y transversal aplicando muestreo por juicio, que incluyó a los 29 pacientes que cumplieron con los criterios de inclusión en el estudio y acudieron a la jornada de atención odontológica desarrollada en la comunidad Nueva Vida, Guayaquil, Ecuador; por parte de la Universidad Politécnica Salesiana, Campus María Auxiliadora, en 2023.**Resultados:** a) prevalencia de enfermedad periodontal(79,31%); b) prevalencia de maloclusión (82,76%); c) prevalencia de fluorosis dental (44,82%); d) prevalencia de necrosis pulpar (6,89%). Conclusiones: Predominó la enfermedad periodontal y maloclusión en edad inferior a 18 años y en sexo femenino. La fluorosis dental predominó en sexo masculino y edad inferior 18 años. La necrosis pulpar se presentó en edad menor a 18 años, sin predominio por sexo. No se evidenció una asociación estadísticamente significativa entre enfermedad periodontal, maloclusión, fluorosis y necrosis pulpar con el grupo etario y sexo.

Palabras clave: odontología, epidemiología, edad, sexo, enfermedad.

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

1. Introduction

Periodontal disease is a condition of the tissues that make up the periodontium, which causes loss of attachment and destruction of the alveolar bone. In the most severe cases, it can result in tooth loss. The diagnosis is made based on the clinical signs and symptoms of the tissues. In a healthy periodontium, a pale pink stippled gum can be observed; however, this characteristic can vary according to different races (1). It is estimated that chronic periodontitis has a global prevalence ranging from 15 to 30 % (2). In Ecuador, an estimated prevalence of mild periodontitis has been recorded in 21.7 % of cases, moderate periodontitis in 34.9% and severe periodontitis in 39.7 % , using Armitage criteria (3).

The American Association of Periodontology classifies periodontal diseases into several categories: I) Gingival diseases, which include plaque-induced and non-plaque-induced diseases; II) Chronic periodontitis, which may be localized or generalized; III) Aggressive periodontitis, also classified as localized or generalized; IV) Periodontitis as a manifestation of a systemic disease; V) Necrotizing periodontal diseases; VI) Abscesses of the periodontium; VII) Periodontitis associated with endodontic lesions; and VIII) Developmental or acquired deformities and conditions.

Dental fluorosis is an alteration in the normal development of enamel caused by excessive exposure to fluoride, which interferes with the proper formation of hydroxyapatite crystals in the enamel. This disorder is classified as mild, moderate and severe, depending on the degree of involvement and the extent of visible stains on the enamel. The severity of fluorosis is directly related to the time and duration of exposure, with the main risk factors being the consumption of drinking water with a high fluoride content, the use of fluoride supplements and excessive topical application of fluoride products. The most critical period of overexposure occurs between 1 and 4 years of age, when teeth are developing, while at 8 years of age, the risk decreases considerably, since permanent teeth have completed their formation. The most commonly affected teeth are the permanent incisors, which often show discoloration and, in severe cases, even structural defects. The safe level of fluoride intake is estimated between 0.05 and 0.07 mg F/kg/day, to avoid complications such as fluorosis (4).

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

On the other hand, pulp necrosis is a serious pathological process that involves the degeneration of pulp tissue within the teeth. It is usually caused by bacterial infections (septic etiology) or physical trauma that compromise the vascular-nervous system of the dental pulp, preventing the supply of blood and nerves necessary for its vitality. There are three main types of pulp necrosis: by coagulation, in which the pulp denatures and hardens; by liquefaction, where the tissue dissolves forming a viscous material; and pulp gangrene, characterized by the putrefaction of the pulp tissue due to bacterial invasion (5, 6). Pulp necrosis can result in the complete loss of tooth vitality, requiring interventions such as root canal treatments or, in advanced cases, the extraction of the affected tooth.

Furthermore, malocclusion is one of the most common alterations in oral health and constitutes a major public health problem due to its prevalence and the functional and aesthetic implications it entails. Malocclusion refers to an incorrect alignment of the teeth, which affects the way they relate to each other when the mouth is at rest or during chewing. This alteration can be influenced by multiple factors, including the shape and size of the teeth, the craniofacial growth pattern, the configuration of the dental arches and the eruption schedule of permanent teeth. The consequences of an untreated malocclusion can include chewing difficulties, speech problems, jaw pain and an increased risk of periodontal diseases (7).

Considering that dental fluorosis, pulp necrosis and malocclusion are common clinical conditions in dental practice and can significantly affect patients' quality of life, it is crucial to conduct this research in the Nueva Vida community. This community faces limitations in accessing on-site dental care, which underlines the importance of exploring the prevalence and potential solutions to these dental pathologies in a context where adequate prevention and treatment are less accessible.

For the above reasons, the objective of this research is to determine the prevalence of periodontal disease, malocclusion, dental fluorosis and pulp necrosis, in the Nueva Vida community, Guayaquil, Ecuador, in order to direct oral health promotion and secondary prevention campaigns, based on the most frequently detected oral pathologies in the community studied.

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

2. Materials and Methods

A quantitative, observational, descriptive and cross-sectional study was carried out, applying judgmental sampling, which included the 29 patients who met the inclusion criteria in the study and who attended the dental care day developed in the Nueva Vida community, Guayaquil, Ecuador; by the Salesian Polytechnic University, María Auxiliadora Campus, in 2023.

Inclusion criteria were voluntary participation in the study, age over 6 years, not having received dental treatment in the previous 6 months, and residing in the Nueva Vida community. Exclusion criteria: Not residing in the Nueva Vida community, patients with dental treatment in the last six months, or with a history of allergic reactions to dental material. Variables considered in this research: age, sex, periodontal disease, fluorosis, malocclusion, and pulp necrosis.

The instrument used for data collection was the Single Dental Clinical History form (HCU-033) and the clinical data registration form. The procedure used for data collection included the selection of subjects who met the inclusion criteria described previously. For the diagnosis of periodontal disease, fluorosis, malocclusion and pulp necrosis, the following parameters were considered, determined from the clinical examination performed on the subjects included in the study, considering the following indices and scales:

Periodontal disease was classified according to its severity as mild, moderate, and severe or advanced, based on the loss of attachment. In the case of mild disease, an attachment loss of between 1 and 2 millimeters was observed. For moderate disease, the attachment loss was 3 to 4 millimeters. Finally, in severe or advanced cases, an attachment loss greater than 5 millimeters was presented, which in many cases can lead to tooth loss (8). This classification allows to evaluate the degree of involvement of the periodontium and to plan an appropriate treatment according to the severity of the disease.

Regarding malocclusion, Angle's classification was used, which distinguishes three main classes. Class I is characterized by the mesio -buccal cusp of the upper first molar occluding in the mesio -buccal groove of the lower first molar, which is considered a normal occlusion. Class II, on the other hand, is defined when the mesio -buccal cusp of the upper first molar occludes in front of the mesio -buccal groove of the lower first molar, which generates a misaligned occlusion. Finally, in Class III, the mesio -buccal cusp of the upper

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

first molar occludes behind the mesio -buccal groove of the lower first molar, producing a more marked misalignment (7). This classification is essential for orthodontic diagnosis and treatment.

Dental fluorosis was assessed using a classification ranging from normal to severe. In normal, healthy teeth, the enamel appears smooth, shiny and without opacities. In very mild cases, small white opaque areas are observed affecting less than 25% of the labial surface of the tooth. When fluorosis is mild, the opacities are more evident, but cover less than 50% of the tooth surface. In moderate cases, these opacities cover 50% or more of the tooth surface, while in severe fluorosis, the enamel is deeply affected, with alterations in its morphology, an eroded appearance and the presence of brown spots (9). This assessment helps to determine the degree of damage to the enamel due to excessive exposure to fluoride.

Finally, pulp necrosis was diagnosed in teeth that presented certain characteristic signs. These included changes in tooth color, with a darker shade compared to healthy teeth. In some cases, complete destruction of the dental crown was evident, leaving only the tooth roots exposed. In addition, pulp necrosis was confirmed by the lack of response to thermal tests, which indicate the loss of vitality of the pulp tissue (10). These criteria are essential for the diagnosis and treatment of teeth with necrosis.

Data analysis was performed by entering the data into a Microsoft Excel spreadsheet (version 2021), structured based on the variables described above, where the clinical data corresponding to the evaluated subjects who met the inclusion criteria were tabulated.

The data analysis was processed by the statistical software Statistical Package for the Social Sciences (SPSS version 26), using: a) univariate analysis (with frequency histograms for qualitative variables and calculation of central tendency measures in quantitative variables) ; b) bivariate analysis (using contingency tables and Pearson's Chi Square test, considering the value of $p<0.05$ as statistically significant).

Regarding bioethical aspects, the subjects included in the study and/or their legal guardians voluntarily agreed to participate. The authors of this research declare that they have no conflicts of interest.

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

3. Results

The 29 patients who met the inclusion criteria were between 7 and 79 years old, with an estimated mean of 15.72 years and SD ± 12.76 years. There was a predominance of adolescents in the subjects evaluated (Figure 1).

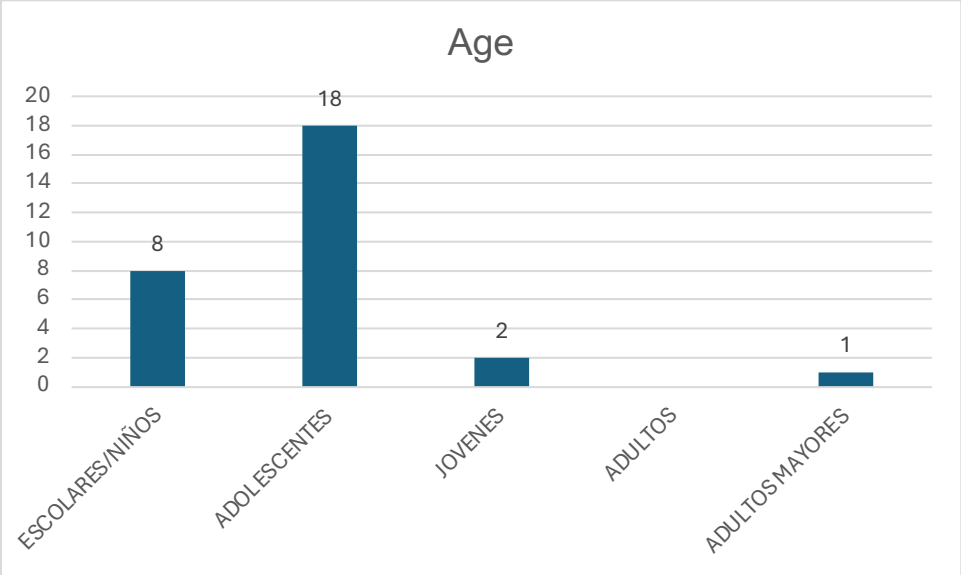

Figure 1. Distribution of subjects assessed by age groups.

On the other hand, there was a predominance of the female sex (62.06%) over the male sex (37.94%) in the population studied (figure 2).

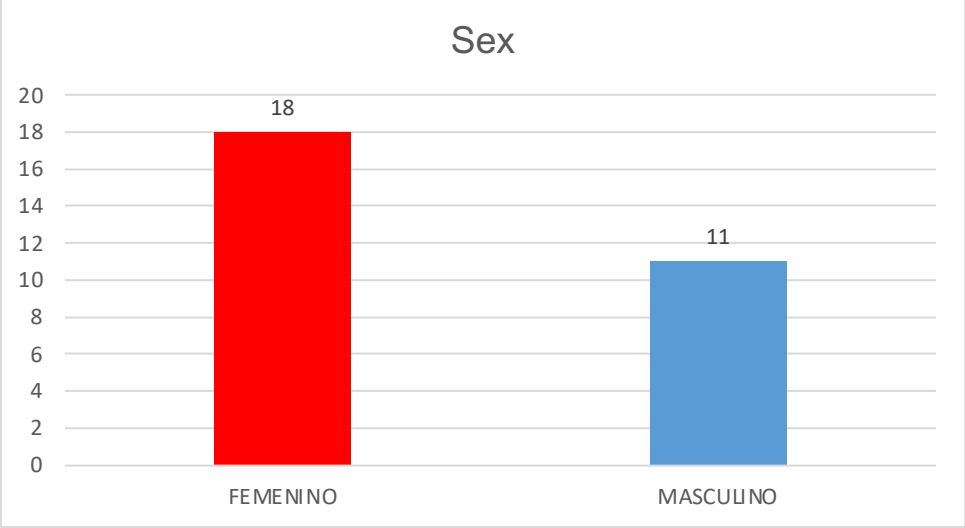

Figure 2. Distribution of the subjects evaluated, according to sex.

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

Regarding the prevalence of periodontal disease, it was found that 79.31 % of the subjects studied had mild periodontal disease, 82.61% had severe periodontal disease, and 4.35% had moderate periodontal disease (Figure 3).

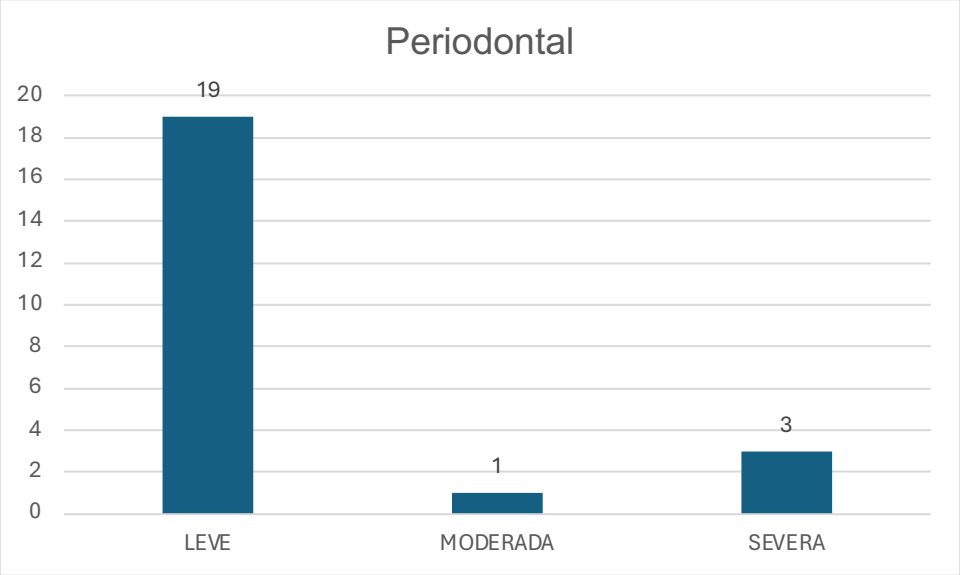

Figure 3. Distribution of the frequency of periodontal disease, according to the level of severity.

When studying the prevalence of malocclusion, it was found that 82.76% had a relationship between the first upper molar and the first lower molar compatible with Angle class I, 13.79% had a malocclusion corresponding to Angle class II and 3.45% had Angle class III (Figure 4).

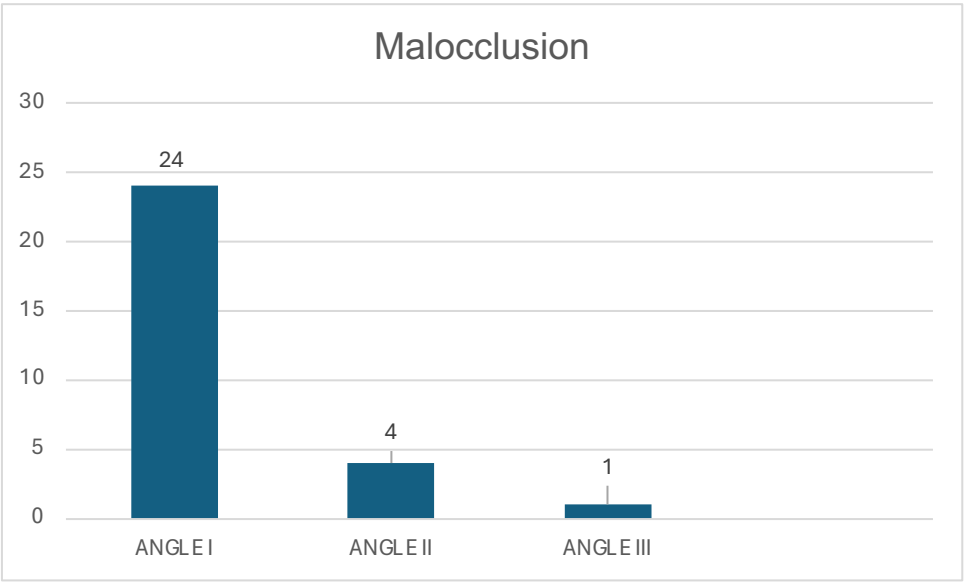

Figure 4. Distribution of malocclusion frequency, according to Angle classification.

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

Fluorosis had a prevalence of 44.82 % . It should be noted that all subjects in whom dental fluorosis was detected had clinical characteristics compatible with the mild stage (Figure 5).

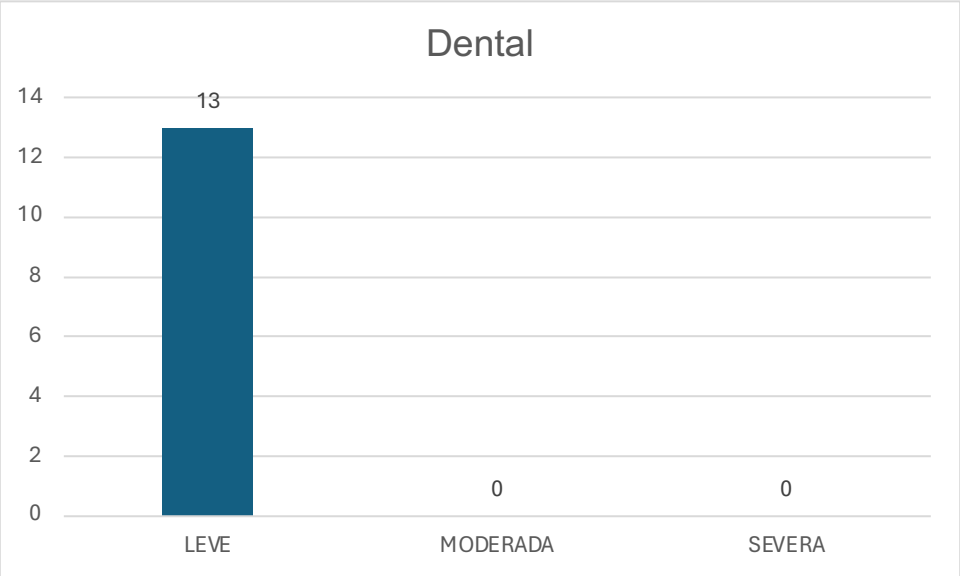

Figure 5. Distribution of the frequency of dental fluorosis, according to the level of severity.

Pulp necrosis occurred in only 6.89% of the subjects studied (see Figure 6). It is pertinent to mention that both cases were recorded in adolescents between 16 and 17 years of age.

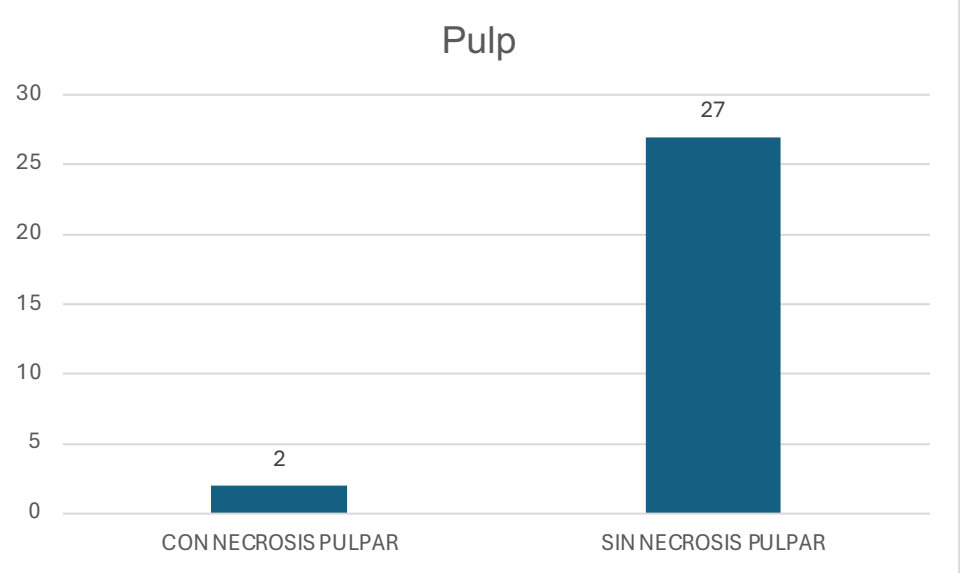

Figure 6. Distribution of the frequency of pulp necrosis in the subjects evaluated.

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

When performing the bivariate analysis between periodontal disease, malocclusion, fluorosis and pulp necrosis with the age group and sex of the study participants, a predominance of the prevalence of periodontal disease and malocclusion was evident in those under or equal to 18 years of age and in the female sex (Table 1). On the other hand, the prevalence of dental fluorosis predominated in the male sex and in those under or equal to 18 years of age and in the male sex. Regarding the prevalence of pulp necrosis, it occurred exclusively in those under or equal to 18 years of age, with no predominance by sex being evident. It should be noted that no statistically significant association was obtained between: a) periodontal disease and age (p= 0.160); b) periodontal disease and sex (p= 0.794); c) malocclusion and age (p= 0.967); d) malocclusion and sex (p= 0.917); e) fluorosis and age (0.525); f) fluorosis and sex (p= 0.111); g) pulp necrosis and age (p= 0.454); h) pulp necrosis and sex (p= 0.715).

Table 1. Bivariate analysis between age, sex, periodontal disease, malocclusion, fluorosis and pulp necrosis.

Variable		Age		Sex	
		<18 years (Children and Teenagers)	>18 years Youth, Adults and Seniors	Female	Male
Periodontal Disease	YEAH	17 (58.6%)	6 (20,7%)	14 (48,3%)	9 (31%)
	NO	6 (20.7%)	0 (0%)	4 (13,8%)	2 (6,9%)
	p	0,160		0,794	
Maloclusión	ANGLE I	19 (65,5%)	5 (17,2%)	15 (51,7%)	9 (31%)
	ANGLE II Y III	4 (13,8%)	1 (3,4%)	3 (10,3%)	2 (6,9%)
	p	0,967		0,917	
Fluorosis	YEAH	11 (37,9%)	2 (6,9%)	6 (20,7%)	7 (24,1%)
	NO	12 (41,4%)	4 (13,8%)	12 (41,4%)	4 (13,8%)
	p	0,525		0,111	
Pulp necrosis	YEAH	2 (6,9%)	0 (0%)	1 (3,4%)	1 (3,4%)
	NO	21 (72,4%)	6 (20,7%)	17 (58,6%)	10 (34,5%)
	p	0,454		0,715	

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

4. Discussion

A prevalence of periodontal disease was found in 79.31 % of the subjects studied. This finding contrasts with a study conducted in Mexico in 2019 by Viramontes et al. (11), which included 54 university students, with an average age of 18.87 years; showing an estimated prevalence of periodontal disease of 27.8%. On the other hand, a study conducted in Mexico in 2020 by Lira et al. (12), which included 3968 patients, with an average age of 15 years, who attended a university dental clinic, recorded an estimated prevalence of periodontal disease of 2%.

When studying the prevalence of malocclusion, it was found that 82.76 % had a relationship between the first upper molar and the first lower molar compatible with class I of the Angle classification. These results contrast with a research carried out in Cuba during 2021, by Villafañe and De Los Reyes (13), which included 61 children between the ages of 6 and 11 years, recorded a prevalence of malocclusion of 44.26%, with class II predominating in the Angle classification.

Dental fluorosis recorded a prevalence of 44.82 % . It should be noted that all subjects, in whom dental fluorosis was detected, presented clinical characteristics compatible with the mild stage. These findings contrast with a research developed in Mexico, by Aguirre et al. (14),), which included 209 high school students, aged between 12 and 15 years, obtaining an estimated prevalence of dental fluorosis of 79.9 % . On the other hand, a review of the literature developed in Ecuador, in 2023, which included 15 studies framed in the detection of dental fluorosis; recorded an average prevalence of dental fluorosis of 12.67 % .

Pulp necrosis occurred in only 6.89% of the subjects studied. It is pertinent to mention that the two cases were recorded in adolescents between the ages of 16 and 17 years old. A research carried out in Ecuador, by Hurtado et al., which included 174,611 patients treated in health centers between 2017 and 2020, in Zone 7 of the Ministry of Public Health; recorded a prevalence of pulp necrosis of 6.63% (15).

A predominance of the prevalence of periodontal disease and malocclusion was evidenced in the age group less than or equal to 18 years and in the female sex. On the other hand, the prevalence of dental fluorosis predominated in the sex less than or equal to 18 years and in the male sex. Regarding the prevalence of pulp necrosis, it occurred exclusively in the age group less than or equal to

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

18 years, without evidence of a predominance by sex. There was no statistically significant association between periodontal disease, malocclusion, fluorosis and pulp necrosis with the age group and sex. These results contrast with a research published in Peru during 2019, developed by Manzur (16), which included the review of 49,619 clinical records corresponding to patients treated in a health center, between 2010 and 2017, with an estimated mean age of 21.9 years; which reported a prevalence of pulp necrosis in children estimated at 24.4%. On the other hand, in adolescents, the prevalence of pulp necrosis was 10.2% and gingivitis in 8.1%. In young people, a prevalence of pulp necrosis was recorded in 12.4% and gingivitis in 10.8%. In adults, a prevalence of pulp necrosis was evidenced in 23.1% and gingivitis in 10.8%. In older adults, pulp necrosis was recorded in 45.5% of cases. In relation to the male gender, pulp necrosis was recorded in 24.9% and gingivitis in 5.3%. In the female gender, pulp necrosis was detected in 16.4% and gingivitis in 8.2%. Reporting a statistically significant association when correlating oral diseases and age group ($p = 0.000 < 0.05$), as well as the presence of oral diseases and gender ($p = 0.000 < 0.05$).

A study conducted in Ecuador by Hurtado et al., which included 174,611 patients between the ages of 20 and 40, treated in health centers during 2017 to 2020, in Zone 7 of the Ministry of Public Health; recorded a prevalence of pulp necrosis in 11,597 cases. In these cases, a predominance was recorded in the female sex and age between 20 and 31 years (15).

5. Conclusions

Predominance of mild periodontal disease prevalence was evident .

Malocclusion compatible with Class I in the Angle classification was the most frequent stage in the subjects evaluated.

All cases of dental fluorosis detected correspond to the mild stage.

Pulp necrosis occurred exclusively in the adolescent age range.

A predominance of the prevalence of periodontal disease and malocclusion was found in the age group under or equal to 18 years and in the female sex. On the other hand, the prevalence of dental fluorosis predominated in the sex under or equal to 18 years and in the male sex. Regarding the prevalence of pulp necrosis, it occurred exclusively in the age group under or equal to 18 years, with no predominance by sex being found. No statistically significant

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

association was found between periodontal disease, malocclusion, fluorosis and pulp necrosis with the age group and sex.

6. Authors' Contribution

KLCG: Data collection, analysis of results and final review of the article.
FSA: Data collection, discussion and final revision of the article.
LESP: Analysis of results, discussion, final revision of the article.

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

References

1 Highfield J. Diagnosis and classification of periodontal disease. Aust Dent J. 2009; 54:(1). https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1834-7819.2009.01140.x

2 Duque A. Prevalence of chronic periodontitis in Latin America. Rev Clínica Periodontologia, Implantol y Rehabil Oral. 2016;9(2):208–15. https://doi.org/10.1016/j.piro.2016.07.005

3 Fernández W, Lara D. Comparison between the criteria for periodontal diagnosis of EKE and COLS. and the protocols of the Ministry of Public Health 2014 in patients of the. https://dspace.ucuenca.edu.ec/bitstream/123456789/24040/1/RESIS.pdf

4 Abanto J, Rezende KM, Marocho SM, Alves FB, Celiberti P, Ciamponi AL. Dental fluorosis: exposure, prevention and management. Med Oral Pathol Oral Cir Bucal . 2009.1;14(2):E103-7. PMID: 19179949. http://www.medicinaoral.com/pubmed/medoralv14_i2_pE103.pdf

5 Sahli CC, Aguadé EB. Endodontics: Clinical Techniques and Scientific Basis. 3rd ed. Spain: Elsevier Masson; 2014.

6 Sapp P. Lewis R. Eversole G. Contemporary oral and maxillofacial pathology. Second edition. Mosby Elsevier Publishing Madrid-Spain 2006; 78-79.

7 Murrieta J, Cruz P, López J, Marques D, & Zurita V. Prevalence of dental malocclusions in a group of Mexican adolescents and their relationship with age and gender. Acta Odontol. Venice . . 2007; 45(1), 74-78. https://www.actaodontologica.com/ediciones/2007/1/art-13/

8 Vargas A, Yáñez B. Classification of periodontal and peri-implant diseases and conditions 2018. Part one. Rev. Odontol Mex. 2022; 24;25(1):10-26. https://www.medigraphic.com/cgi-bin/new/resumen.cgi?IDARTICULO=104194

9 Estrada C, Llodra J. Dental fluorosis in a sample of adolescents from the state of Coahuila, Mexico. Acta univ 2019; 29: e1992.https://doi.org/10.15174/au.2019.1992

10 Arias A. *Endodontics manual: The definitive guide*. Grupo Asís, Biomedia SL; 2022. https://dspace.itsjapon.edu.ec/jspui/handle/123456789/3955

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79

11 Viramontes A, Medrano E, Franco C, Reyes, C, Medrano, J, Morales, G. Prevalence of periodontal disease, nutritional status and healthy eating index in nutrition students. Rev Mex Med Forense Cienc Salud. 2020.4(S1):112-114. https://www.medigraphic.com/pdfs/forense/mmf-2019/mmfs191zl.pdf

12 Lira L, Belmont N, Huitrón P, Ortiz E, Hernández Y, Lucero A. Prevalence of Oral Diseases in 2016-2017 at the admission clinic of the Faculty of Dentistry of the UATx . Rev Mex Med Forense Cienc Salud. 2020;4(S1), 64-66.https://www.medigraphic.com/cgi-bin/new/resumen.cgi?IDARTICULO=95102

13 Villafañe A, De los Reyes C. Prevalence of malocclusions in children at the "Ángel Bello Vega" Primary School. UNIMED Student Scientific Journal. 2022;4(2). https://revunimed.sld.cu/index.php/revestud/article/view/220

14 Aguirre A, Tiznado G, Jiménez E, Amaro C, Castañeda A. Prevalence of dental fluorosis in students of the " Cuitlahuac " General Secondary School in Rosa Blanca. Tame Magazine, 2020;9(26), 1045-1048. https://www.uan.edu.mx/d/a/publicaciones/revista_tame/numero_26/Tam2026-3i.pdf

15 Hurtado I, Verdugo L, Tinitana V, Cabrera C. Prevalence of pulp necrosis in patients aged 20 to 40 years treated in the Ministry of Public Health of Ecuador, zone 7, in the period 2017-2020. Scientific Journal of Dental Specialties UG, 2023; 6(1), 10-16. DOI: https://doi.org/10.53591/eoug.v6i1.1629

16 Manzur M. (2019). Prevalence of oral diseases by age and gender in patients from 2010 to 2017 of the IPRESS I–4 San Juan, Iquitos–2018. http://repositorio.ucp.edu.pe/handle/UCP/674

DOI: https://doi.org/10.58995/redlic.rmic.v3.n1.a79