

ORIGINAL RESEARCH

Prevalence of vertical occlusion alterations

Prevalencia de las alteraciones de la oclusión en sentido vertical

Katherin Dayana Chumo Rivero ¹. Carlos Ernesto Véliz Arauz ². Karla Lissette Gruezo Montesdeoca ³

¹ Student, Universidad San Gregorio de Portoviejo. <https://orcid.org/0009-0009-4736-6345>

² Faculty Member, Universidad San Gregorio de Portoviejo. <https://orcid.org/0009-0000-5190-055X>

³ Faculty Member, Universidad San Gregorio de Portoviejo. <https://orcid.org/0000-0002-3042-1944>

Correspondence: e.kdchumo@sangregorio.edu.ec

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ABSTRACT

Objective: Identify the prevalence of vertical occlusion alterations in patients treated at the postgraduate orthodontics clinics of San Gregorio de Portoviejo University during the year 2025. **Materials and methods:** An observational, descriptive, cross-sectional prevalence study was conducted with a quantitative approach and a non-experimental design. Three hundred and seventy-four medical records of patients treated between January and December 2025 were reviewed, selected using census sampling. The variables analyzed included the type of vertical alteration, facial biotype, sex, age, and mandibular plane. Data were processed using IBM SPSS Statistics with descriptive statistics and the chi-square test. **Results:** 48.9% of patients did not present vertical malocclusions, while deep bite was the most prevalent (41.4%), followed by open bite (9.6%). The mesofacial biotype predominated in females (48.9%), while the dolichofacial biotype predominated in males (44%). An increased mandibular plane was the most frequent in all three vertical occlusion categories (46.2-48.7%). No statistically significant association was found between facial biotype and vertical occlusion type ($p = 0.652$), nor between the mandibular plane and vertical occlusion ($p = 0.33$). **Conclusions:** Deep bite was the most frequent vertical malocclusion in the studied population. The mesofacial biotype predominated in women and the dolichofacial biotype in men, while the mandibular plane did not act as a determining factor in the type of vertical occlusion.

Keywords: Dental Occlusion; Orthodontics; Open Bite; Overbite.

RESUMEN

Objetivo: Identificar la prevalencia de las alteraciones de la oclusión en sentido vertical en pacientes atendidos en las clínicas de posgrado de ortodoncia de la Universidad San Gregorio de Portoviejo durante el año 2025. **Materiales y métodos:** Se realizó un estudio observacional, descriptivo, de prevalencia y corte transversal, con enfoque cuantitativo y diseño no experimental. Se revisaron 374 historias clínicas de pacientes atendidos entre enero y diciembre de 2025, seleccionadas mediante muestreo censal. Las variables analizadas incluyeron el tipo de alteración vertical, el biotipo facial, el sexo, la edad y el plano mandibular, procesando los datos en IBM SPSS Statistics mediante estadística descriptiva y la prueba de chi-cuadrado. **Resultados:** El 48,9% de los pacientes no presentó alteraciones verticales, mientras que la mordida profunda fue la más prevalente (41,4 %), seguida de la mordida abierta (9,6 %). El biotipo mesofacial predominó en el sexo femenino (48 %), mientras que en el sexo masculino predominó el dolicofacial (44 %). El plano mandibular aumentado fue el más frecuente en las tres categorías de oclusión vertical (46,2-48,7 %). No se encontró asociación estadísticamente significativa entre el biotipo facial y el tipo de oclusión vertical ($p = 0,652$), ni entre el plano mandibular y la oclusión vertical ($p = 0,33$). **Conclusiones:** La mordida profunda constituyó la alteración vertical más frecuente en la población estudiada. Predominó el biotipo mesofacial en mujeres y el dolicofacial en hombres, mientras que el plano mandibular no actuó como factor determinante del tipo de oclusión vertical.

Palabras clave: Oclusión Dental; Ortodoncia; Mordida Abierta; Sobremordida.

INTRODUCTION

According to the World Health Organization (WHO), malocclusions represent one of the most common oral health problems worldwide¹. In a systematic review conducted in Saudi Arabia, the global prevalence of vertical occlusal alterations was considerable; approximately 21.98% of individuals were estimated to have deep overbite, while approximately 4.93% presented with open bite, demonstrating that vertical discrepancies are not marginal and highlighting their clinical and epidemiological importance².

The presence of vertical alterations directly affects essential functions such as mastication, speech, and occlusal stability, as well as facial aesthetics, thereby affecting patients' quality of life^{3,4}. In Latin America, deleterious oral habits have been associated with a higher prevalence of Class II and Class III malocclusions, particularly among females⁵.

In countries in the region such as Mexico, significant percentages of anterior open bite have been reported, reaching 35.1%, together with a vertical overbite of 11.5%⁶. In Ecuador, although studies have not focused exclusively on vertical alterations, high rates of skeletal Class II and Class III malocclusions have been identified in the province of Azuay, which could suggest underlying vertical discrepancies⁷.

The Universidad San Gregorio de Portoviejo (USGP), a private higher education institution located in the city of Portoviejo, capital of the province of Manabí, has a School of Dentistry with postgraduate orthodontic clinics where a large population of patients with various oral conditions is treated. Understanding the distribution of vertical alterations is essential for strengthening clinical practice, designing care protocols, and improving the quality of the services provided⁵. Therefore, the following research question was proposed: What is the prevalence of vertical occlusal alterations among patients treated at the postgraduate orthodontic clinics of the Universidad San Gregorio de Portoviejo during 2025?

This study aims to generate updated data on the distribution of vertical alterations among the population treated at the USGP postgraduate orthodontic clinics. This will make it possible to determine the prevalence of this condition, guide clinical decision-making, and strengthen the quality of dental services provided in the university and provincial context. Accordingly, the general objective of this study was to identify the prevalence of vertical occlusal alterations among patients treated at the postgraduate orthodontic clinics of the Universidad San Gregorio de Portoviejo during 2025. The specific objectives were to quantify the types of vertical malocclusions documented in the clinical records, characterize facial biotypes according to the patient's sex, and describe vertical occlusal alterations and mandibular plane abnormalities.

MATERIALS AND METHODS

An observational, descriptive, prevalence-based, cross-sectional study was conducted using a quantitative approach and a non-experimental design. Additionally, the chi-square test was applied for exploratory purposes, with a significance level of 0.05. The information was analyzed at a single point in time corresponding to the period from January to December 2025. No intervention was performed on the patients or on the variables studied; the analysis was limited to the review of existing clinical records.

The study was conducted in the postgraduate Orthodontics clinics of the Universidad San Gregorio de Portoviejo. The initial population consisted of 476 clinical records (CRs) of patients treated during the aforementioned period. For sample selection, clinical records were included if they contained informed consent signed at the beginning of clinical care and complete records of the variables required for the study analysis. Clinical records that were incomplete, did not clearly or legibly document the variables of interest, lacked informed consent, or contained inconsistent information that prevented proper interpretation were excluded. Ultimately, a sample of 374 clinical records was obtained.

The data collection technique consisted of reviewing clinical records, and the instrument was a data collection form specifically designed for this study. The form recorded sociodemographic variables, such as sex and age, as well as clinical variables related to vertical occlusion, including the type of vertical alteration (open bite, deep bite, or no alteration), facial biotype, and mandibular plane. Data collection was performed systematically by reviewing each included clinical record and recording the corresponding information on the data collection form.

The collected information was organized and analyzed using descriptive statistics, including absolute frequencies and percentages. IBM SPSS Statistics version 31 was used for the analysis, and the results were presented in statistical tables, allowing the prevalence of vertical occlusal alterations in the study population and their distribution according to the variables analyzed to be determined. Valid cases were used for each variable because some clinical records did not contain all the data required for analysis.

This study was conducted in accordance with the ethical principles established in the Declaration of Helsinki. As this was a documentary study based on the review of dental clinical records, prior institutional authorization was obtained from the Coordination of the School of Dentistry, which is responsible for the custody and protection of patients' clinical information. The information analyzed corresponded to clinical records previously generated during dental care, which already included institutional informed consent signed by the patient authorizing the use of their data for academic and healthcare purposes. In the case of minors, the minor's assent and the legal guardian's consent were additionally obtained. Due to the documentary nature of the study and the use of previously recorded information, participants were not exposed to physical, psychological, or social risks resulting from the research.

For the analysis by age groups, the classification established by the Ministry of Public Health of Ecuador was used, which defines childhood as the period from 0 to 9 years, adolescence from 10 to 19 years, and adulthood from 20 to 64 years⁸. For the analysis by sex, the biological classification established by the World Health Organization (WHO) was used, which defines sex as the biological characteristics that define human beings as male or female, noting that although these sets of biological characteristics are not mutually exclusive, they tend to differentiate human beings into these two categories⁹.

This classification was used in the present study because the data were obtained from institutional clinical records, in which sex is recorded according to this biological categorization. Although greater diversity in terms of gender identity is currently recognized, the sex variable recorded in clinical records is based on biological and morphological criteria, which are relevant to the analysis of facial biotype and occlusal alterations, as these are directly related to differentiated craniofacial growth patterns between males and females.

Confidentiality and anonymity of the collected information were ensured at all times through the use of alphanumeric codes, avoiding the use of information that could identify patients. Likewise, the study was approved by the Research Ethics Committee for Human Subjects (CEISH) of the Universidad San Gregorio de Portoviejo (CEISH-USGP-OBS-ODO-2026-026).

RESULTS

A total of 374 clinical records of patients treated at the postgraduate Orthodontics clinics of the Universidad San Gregorio de Portoviejo during 2025 were analyzed, with the purpose of determining the prevalence of vertical occlusal alterations and their distribution according to different clinical and sociodemographic characteristics.

The sample consisted of 374 patients. Of these, 215 (57.5%) were female and 159 (42.5%) were male (Table 1).

Table 1. Distribution of facial biotype according to sex

Sex	Brachyfacial	Mesofacial	Dolichofacial	Total
Male	29 (18%)	60 (38%)	70 (44%)	159 (43%)
Female	39 (18%)	103 (48%)	73 (34%)	215 (57%)
Total	68 (18%)	163 (44%)	143 (38%)	374 (100%)

Pearson's chi-square test: $\chi^2 = 4.595$; df = 2; p = 0.101

Source: Data collected from clinical records. Authors' own elaboration.

Regarding facial biotype according to sex, among the 215 female patients, 48% presented with a mesofacial biotype, making it the most frequent biotype in this group. In contrast, among the 159 male patients studied, the dolichofacial biotype predominated, accounting for 44%. The chi-square test showed no statistically significant association between sex and facial biotype (Table 1).

Table 2. Distribution of facial biotype according to age

		Facial Biotype			Total
		Brachyfacial	Mesofacial	Dolichofacial	
Age group	Childhood	1 (7%)	9 (64%)	4 (29%)	14 (3.7%)
	Adolescence	33 (17%)	80 (42%)	77 (41%)	190 (50.8%)
	Adults	34 (20%)	74 (44%)	62 (36%)	170 (45.5%)
Total		68 (18%)	163 (44%)	143 (38%)	374 (100%)

Pearson's chi-square test: $\chi^2 = 3.530$; df = 4; p = 0.473

Source: Data collected from clinical records. Authors' own elaboration.

Regarding the distribution by age group, Table 2 shows that the adolescent group was the largest (50.8%), followed by adults (45.5%) and children (3.7%). The mesofacial biotype predominated across all three age groups, with no statistically significant association between age and facial biotype ($\chi^2 = 3.530$; $p = 0.473$).

Table 3. Distribution of vertical occlusion according to facial biotype

		Facial Biotype			
		Brachyfacial	Mesofacial	Dolichofacial	Total
Classification of vertical occlusion	Open bite	4 (11%)	17 (47%)	15 (42%)	36 (10%)
	Deep bite	31 (20%)	70 (45%)	54 (35%)	155 (41%)
	No alteration	33 (18%)	76 (42%)	74 (40%)	183 (49%)
Total		68 (18%)	163 (44%)	143 (38%)	374 (100%)

Pearson's chi-square test: $\chi^2 = 2.459$; $df = 4$; $p = 0.652$

Source: Data collected from clinical records. Authors' own elaboration.

The results presented in Table 3 show that 49% of patients did not present vertical alterations, 41% presented with deep bite, and 10% with open bite. The mesofacial biotype predominated across all three categories, with no statistically significant association between facial biotype and vertical occlusion ($\chi^2 = 2.459$; $p = 0.652$).

Table 4. Distribution of vertical occlusion according to the mandibular plane

		Mandibular plane				
		Measure	Increased	Decreased	Normal	Total
Vertical occlusion	Open bite	n	14	3	12	29
		%	48.3%	10.3%	41.4%	
	Deep bite	n	67	11	67	145
		%	46.2%	7.6%	46.2%	
	No alteration	n	74	12	66	152
		%	48.7%	7.9%	43.4%	
Total		n	155	26	145	326
		%	47.5%	8.0%	44.5%	100%

Pearson's chi-square test: $\chi^2 = 13.728$; $df = 6$; $p = 0.33$

Source: Data collected from clinical records. Authors' own elaboration.

Regarding the relationship between the mandibular plane and the classification of vertical occlusion, the analysis was conducted on 326 clinical records, as no data regarding the mandibular plane were recorded in the remaining 48 records. Table 4 shows that the increased mandibular plane was predominant (47.5%), both in patients with open bite (48.3%) and deep bite (46.2%), as well as in those without vertical alterations (48.7%), with no statistically significant association ($\chi^2 = 13.728$; $p = 0.33$).

DISCUSSION

After analyzing the 374 clinical records of patients treated at the postgraduate Orthodontics clinics of the Universidad San Gregorio de Portoviejo during 2025, the findings obtained allow for discussion of the prevalence of vertical occlusal alterations and their distribution according to the clinical and sociodemographic characteristics of the study population.

The vertical dimension is an essential component of the muscular, functional, and esthetic stability of the maxillofacial complex. Its proper maintenance enables efficient mastication, contributes to neuromuscular balance, and ensures a harmonious facial appearance. However, when this dimension is altered, problems such as reduced masticatory efficiency, orofacial pain, changes in mandibular posture, and esthetic alterations may occur¹⁰. Vertical malocclusions are identified by measuring overbite, which determines the degree of vertical overlap between the upper and lower incisors; this category includes open bite and deep overbite².

Deep bite is defined as excessive vertical overlap between the upper and lower incisors that exceeds the physiological overbite of 2 to 3 mm. This condition is one of the most common malocclusions in both children and adults and may manifest with functional problems such as difficulty chewing, altered phonation, tooth wear, and, in some cases, musculoskeletal pain¹¹.

Open bite, on the other hand, is characterized by a lack of vertical contact between the upper and lower teeth when the patient attempts to occlude¹². It can be classified as anterior, posterior, or complete open bite. The anterior form is the most common and can be further subdivided into dental and skeletal open bite. Dental open bite is primarily associated with persistent oral habits, whereas skeletal open bite is related to excessive posterior facial growth, which increases facial height and interferes with anterior occlusal closure¹³. Cephalometry provides angular and linear measurements that help identify facial growth patterns and mandibular rotations and is essential for determining whether an occlusal alteration is of dentoalveolar or skeletal origin. Parameters such as lower anterior facial height, the mandibular plane angle, and the Ricketts VERT index provide a comprehensive view of the vertical behavior of the craniofacial complex, making it possible to understand why certain patients develop open bite or deep bite¹⁴.

Facial biotypes, in turn, represent morphological patterns that directly influence the way each individual develops their occlusion¹⁵. The mesofacial biotype is characterized by balanced facial proportions, moderate masticatory muscle tone, and a harmonious relationship between anterior and posterior facial height, which is generally associated with greater occlusal stability¹⁴. The dolichofacial biotype is characterized by an elongated face, increased anterior facial height, downward and backward mandibular rotation, and weak masticatory musculature. These characteristics favor anterior separation between the teeth and increase the predisposition to open bite patterns^{14,15}. In contrast, the brachyfacial biotype presents a short face with greater masticatory muscle tone, anterior mandibular rotation, and reduced lower facial height. These conditions are clinically associated with the development of deep bites^{14,16}.

In the present study, nearly half of the patients presented with the mesofacial biotype, which was the most predominant in both open bite and deep bite cases, followed by the dolichofacial biotype and, to a lesser extent, the brachyfacial biotype. When the distribution of facial biotypes was analyzed according to sex and age, the mesofacial biotype predominated among females, whereas the dolichofacial biotype predominated among males. These findings differ from those reported by Chacha et al.¹⁷ in a study conducted at the Universidad de Guayaquil, in which a predominance of the mesofacial biotype was identified in both males and females, suggesting that this biotype represents the most common facial pattern regardless of sex¹⁷. However, in the present study, males showed a tendency toward the dolichofacial biotype.

Regarding age groups, the mesofacial biotype remained predominant in all three groups analyzed. The difference between the mesofacial and dolichofacial biotypes was narrower in the adolescent group than in the other groups, suggesting a more balanced distribution between these two biotypes at younger ages. This finding is consistent with a study conducted in Peru¹⁸, which analyzed the prevalence of facial biotypes using Ricketts cephalometric analysis and likewise found that the mesofacial biotype was predominant across all age groups analyzed.

Regarding the classification of vertical occlusion, nearly half of the patients did not present vertical alterations. Among the identified alterations, deep bite was the most prevalent, followed to a lesser extent by open bite. These findings are partially consistent with those reported by Sánchez and Yañez¹⁹ in Peruvian university students, in whom deep bite was also the most frequent alteration. However, it should be noted that these were different populations: whereas the present study included patients who attended the clinic because they required orthodontic treatment, the Peruvian sample consisted of a general population not selected based on treatment need, which may have influenced the differences in magnitude between the two findings.

When examining the relationship between the type of vertical occlusion and facial biotype in greater depth, the mesofacial biotype was found to be the most frequent in all three groups analyzed, which can be explained by its predominance in the overall sample. Specifically, in cases of deep bite, although mesofacial patients accounted for the largest number of cases, it should be noted that the literature associates this alteration with the brachyfacial biotype, whose reduced lower facial height and greater masticatory muscle strength favor its development¹⁹.

The dolichofacial biotype, in turn, represented the second most frequent category among open bite cases, a finding that is consistent with the description provided by Faria Vera et al.²⁰, who reported that open bites tend to occur more frequently in patients with long-face characteristics associated with excessive growth and increased total facial height, conditions characteristic of the dolichofacial biotype.

Regarding the relationship between the mandibular plane and the classification of vertical occlusion, the increased mandibular plane was predominant in the sample, both among patients with open bite and among those with deep bite and those without vertical alterations.

However, it is noteworthy that the increased mandibular plane also predominated among patients with deep bite, which differs from what would be theoretically expected, as the literature indicates that a decreased mandibular plane is associated with hyperdivergent patterns and a tendency toward deep bite¹¹. This distribution could be explained by the overall predominance of an increased mandibular plane in the total sample, which influenced its occurrence across all vertical occlusion categories.

CONCLUSIONS

In the study sample, females predominated (57%), and the adolescent group was the largest (50.8%) among the three age groups analyzed. Deep bite was the most frequent vertical alteration (41%), followed by open bite (10%), while 49% of patients did not present vertical alterations.

The mesofacial biotype predominated among females (48%), whereas the dolichofacial biotype predominated among males (44%). This indicates a differentiated distribution according to sex, although no statistically significant association was found ($p = 0.101$).

The increased mandibular plane was the most frequent finding across all categories of vertical occlusion. However, no statistically significant association was observed between the mandibular plane and the type of alteration ($p = 0.33$), suggesting that, in this population, the mandibular plane did not act as a determining factor for vertical malocclusions.

REFERENCES

1. Organización Mundial de la Salud [Internet]. Ginebra: Organización Mundial de la Salud; 2026. Disponible en: <https://www.who.int/es/news-room/fact-sheets/detail/oral-health>
2. Alhammadi MS, Halboub E, Fayed MS, Labib A, El-Saaidi C. Global distribution of malocclusion traits: A systematic review. *Dental Press J Orthod*. 2023; 23(6): 40. Disponible en: <https://pmc.ncbi.nlm.nih.gov/articles/PMC6340198/>
3. Göranson E, Sonesson M, Naimi-Akbar A, Dimberg L. Malocclusions and quality of life among adolescents: a systematic review and meta-analysis. *European Journal of Orthodontics*. 2023; 45(3): 295-307. Disponible en: <https://academic.oup.com/ejo/article/45/3/295/7095559>
4. Pan Y, Gui Z, Lyu J, Huang J. The prevalence of malocclusion and oral health-related quality of life among 12- and 15-year-old schoolchildren in Shanghai, China: a cross-sectional study. *BMC Oral Health*. 2024; 24(1315). Disponible en: <https://link.springer.com/article/10.1186/s12903-024-05077-w>
5. Alvarez Barzola O, Veliz Araúz C, Santos Zambrano T. Prevalencia de maloclusiones esqueléticas en relación con el género y los hábitos orales perniciosos: Revisión bibliográfica. *Rev Odontol Basadina*. 2025; 8(2): 66-74. Disponible en: <https://revistas.unjbg.edu.pe/index.php/rob/article/view/2102/2394>
6. Mendoza Oropeza L. Prevalencia de las maloclusiones asociada con hábitos bucales nocivos en una muestra de mexicanos. *Rev Mex Ortod*. 2014; 2(4) :220-227. Disponible en: <https://revistas.unam.mx/index.php/rmo/article/view/54211/0>
7. Borja D, Ortega E, Cazar M. Prevalence of skeletal malocclusions in the population of the province of Azuay - Ecuador. *RSD*. 2021; 10(5): e24010515022. Disponible en: <https://rsdjournal.org/rsd/article/view/15022>
8. Fayad MI. A Literature Review of Vertical Dimension in Prosthodontics Theory and Practice - Part 1: Theoretical Foundations. *Cureus*. 2024; 16(6): e61903. Disponible en: <https://pmc.ncbi.nlm.nih.gov/articles/PMC11161034/>
9. Ministerio de Salud Pública del Ecuador. Manual del Modelo de Atención Integral de Salud - MAIS. Quito: MSP; 2013. Disponible en: https://instituciones.msp.gob.ec/images/Documentos/subse_gobernanza/manual_mais_2013_modificado.pdf
10. Organización Mundial de la Salud. Salud sexual. Ginebra: OMS; 2006. Disponible en: https://www.who.int/es/health-topics/sexual-health#tab=tab_2
11. Watted N, Lone IM, Zohud O, Midlej K, Proff P, Iraqi FA. Comprehensive Deciphering the Complexity of the Deep Bite: Insight from Animal Model to Human Subjects. *J Pers Med*. 2023; 13(10):1472. Disponible en: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10608509/>
12. Casado Fernández, R. Tratamiento interceptivo de la mordida abierta en pacientes en crecimiento. *SANUM*. 2025; 9(1). Disponible en: <https://revistacientificasanum.com/vol-9-num-1-enero-2025-tratamiento-interceptivo-de-la-mordida-abierta-en-pacientes-en-crecimiento/>
13. Wajid MA, Chandra P, Kulshrestha R, Singh K, Rastogi R, et al. Open bite malocclusion: An overview. *J Oral Health Craniofac Sci*. 2018; 3: 011-020. Disponible en: <https://doi.org/10.29328/journal.johcs.1001022> <https://www.craniofacialjournal.com/articles/johcs-aid1022.php>
14. Cerda-Peralta B, Schulz-Rosales R, López-Garrido J, Romo-Ormazabal F. Parámetros cefalométricos para determinar biotipo facial en adultos chilenos. *Rev Clin Periodoncia Implantol Rehabil Oral*. 2019; 12(1). Disponible en: <https://www.redalyc.org/journal/3310/331059337002/html/>

15. Maris Flores S, Losoviz E, Periale L. Análisis de diferentes protocolos cefalométricos laterales parte II: consideraciones sobre diferentes aplicaciones. RAAO. 2021; 64(1): 38-43. Disponible en: <https://docs.bvsalud.org/biblioref/2021/06/1252459/articulo06.pdf>
16. Machado-Gutiérrez A, García-Díaz C, Rodríguez-Ávila J, Gutiérrez-Gil A, Wong-Silva J. Sobremordida vertical excesiva: características clínico-epidemiológicas y tratamiento en menores de 19 años. Rev Ciencias Médicas. 2023; 27(2). Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1561-31942023000200010&lng=es.
17. Chacha B, Bustamante J. Correlación entre biotipo facial clínico y cefalométrico como elementos de diagnóstico en ortodoncia. Rev Cient Espec Odontol UG2018; 1(1): 1-5. Disponible en: <https://revistas.ug.edu.ec/index.php/eoug/es/article/view/1368/3258>
18. Calizana Ayna R, Iglesias Valdivia F. Prevalencia del biotipo facial según el análisis cefalométrico de Ricketts en radiografías obtenidas en un centro radiológico Arequipa 2020. [Tesis en Internet]. Universidad César Vallejo; 2020: 1-43. Disponible en: https://repositorio.ucv.edu.pe/bitstream/handle/20.500.12692/63775/Calizana_AR-Iglesias_VFA-SD.pdf?sequence=1&isAllowed=y
19. Sánchez-Tito M, Yañez-Chávez E. Asociación entre el biotipo facial y la sobremordida: Estudio piloto. Rev. Estomatol. Herediana. 2015; 25(1): 05-11. Disponible en: http://www.scielo.org.pe/scielo.php?script=sci_arttext&pid=S1019-43552015000100002&lng=es.
20. Farias Vera J, De La Torre Escalante E, Tello Rodríguez A. La relación del biotipo y perfil facial según análisis de Ricketts y Burstone en pacientes con maloclusiones. En Santacruz Vélez MA, editor. Estudios interdisciplinarios en ciencias de la salud. 2024; 1: 81-92. Disponible en: <https://press.religacion.com/index.php/press/catalog/download/237/801/1003?inline=1>

DECLARATION OF CONTRIBUTIONS

Conceptualization and design: Katherin Chumo, Carlos Véliz, and Karla Gruezo; Literature review: Katherin Chumo and Carlos Véliz; Methodology and validation: Katherin Chumo and Karla Gruezo; Formal analysis: Katherin Chumo and Carlos Véliz; Investigation and data collection: Katherin Chumo; Resources: Universidad San Gregorio de Portoviejo; Data analysis and interpretation: Katherin Chumo, Carlos Véliz, and Karla Gruezo; Writing—original draft preparation: Katherin Chumo; Writing—review and editing: Carlos Véliz and Karla Gruezo; Supervision: Carlos Véliz and Karla Gruezo; Project administration: Katherin Chumo; Funding acquisition: Not applicable.

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