



(RESEARCH ARTICLE)



## Digital technology in orofacial harmonization

Angela Maria Herrera Arellan \*

*Department of Prosthodontics and Occlusion, Curricular Unit of Dental Surgery, Faculty of Dentistry, University of Carabobo (UC), Venezuela.*

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### Abstract

The field of dentistry had its challenges during and after the pandemic crisis for the provision of its services, which led to reconfigure their strategies. The context of the following article aims to demonstrate the importance of the application of a complementary technological tool called *odontoangela.com* within orofacial harmonization through relationship marketing.

**Method:** The tool was used in a sample of 50 clients-patients within an organization in Valencia, Venezuela.

**Results:** It was shown that the analysis obtained of both dental clinical characteristics and facial thirds through the photographic record, together with the desires and needs expressed through a video before having their first face-to-face consultation, provided significant information to complement a presumptive diagnosis.

**Conclusion:** The use of digital technology can allow the harmonizer the first line of communication via virtual communication with the client-patient, in turn, be a complementary method for diagnosis and planning of the future treatment plan from anywhere, which makes a positive trend in the implementation of strategies aligned towards professional growth and advice to client-patients, which makes, a greater space in the market.

**Keywords:** Clients; Consultation; Diagnosis; Patients; Marketing; Orofacial

### 1. Introduction

Facial appearance is significantly influenced by the dental arches since when units are lost there are gaps that cause both signs of aging and facial asymmetry. Therefore, it should be mandatory that the face be evaluated as a whole. In this sense, dentistry in the search to achieve the facial beauty of dental patient-clients in order to obtain the desired symmetry, harmony and balance of the face has been expanded by integrating with other disciplines such as orofacial harmonization. This makes it possible to individualize the treatment for each client-patient together with the connection between the nature of their behavior and the expression of their external visual language.

This being the case, during the pandemic, new challenges and challenges were generated within the organizations that demand a management of skills and strengths to create strategies that manage to be highly competitive. So, the implementation of relationship marketing through digital technologies in the new specialty of orofacial harmonization, approved in Brazil and Venezuela will demonstrate that it is possible to allow a virtual approach before a face-to-face consultation. In this case, with a tool called *odontoangela.com* applied in 50 client-patients during a test phase receiving images to know both facial and dental signs and their wishes and needs expressed through a video.

\* Corresponding author: Angela Maria Herrera Arellan

### 1.1. The New Era

Accreditation Council for Graduate Medical Education (ACGME) of the United States has specified with the interpersonal and communication skills of the professional that are key competencies and are linked to the exercise of emotional intelligence [1]. Relationship that since Hippocrates has varied a lot, from the paternalistic model to a more humanistic model, emphasizing respect for the autonomy of the client-patient making him/her a participant in his/her treatment, and visualizing him/her as a biopsychosocial being [2]; which makes it more effective to use simple language, with versatility, with greater understanding and personal interest to know the characteristics and understand the needs of the same [1]. In other words, approaching them according to their personality that together with the digital transformation and the unstoppable development of new technologies in their different areas, in this case, the orofacial harmonization that is evolving and revolutionizing [3]; to increase comfort, reduce treatment times and provide precision in the application of processes.

In this regard, American Dental Association President César Sabatés, who says the ADA recognizes the value of diversity in the profession, believes that new digital technologies will continue to influence the way dental care is delivered. In turn, he asserts that innovation has changed the paradigm in many ways, including methods of evaluating clinical and treatment data that when combined with the skills and experience of dentists optimize care for our dental client-patients[3], who are the primary focus and who are defined as the individual user who requests and receives oral health services ranging from diagnosis, The key to the good management of the relationship with them lies in the dentist's ability to manage their needs and expectations with respect to the product or service offered[4].

Likewise, the former President of the Greater New York Dental Meeting, Lauro Medrano-Saldaña, emphasizes that society has had to adopt a series of technological changes following the pandemic, including the way we work and interact with others; he also emphasizes that the practice must grow at a local level, that the service must be promoted online, which will provide more value in daily practice [1]. Thus, authors emphasize that the positive thing is that some digital technologies, such as teleodontology, can be improved [5].

### 1.2. Orofacial Harmonization

It is evident then, that the turn given by dentistry has not only been at the digital level, nor of scientific research, but also because dental professionals are not only limited to study, understand and treat the oral area, but can take a set of actions aimed at restoring aspects of balance, beauty and youth, covering the treatment of teeth, skin, muscles, muscle-aponeurotic system, fat and even bone tissue of the facial area [6]. That is, it has acquired the right to act in the region between the hyoid bone and the hairy area of the forehead, and between the lines passing over the anatomical site of the tragus on each side of the face [7, 8].

This means that the latest and most advanced techniques related to the restoration of facial harmony require dentists who can understand and plan all the complementary treatments related to facial mimicry, the increase of volume at strategic points of the face and also manage asymmetries, whether caused by dental imbalance or muscle hypertrophy [9]; so that they are a whole [10]. Without leaving aside the symmetry and orofacial esthetics that demonstrate the possibility of refining esthetic treatments with the necessary refinement [11, 12].

In this way, the aim is to provide the client-patient with the result that he/she always seeks to achieve in terms of beauty, which in this area would be an intelligent orofacial beauty that is defined as the harmonious and symmetrical balance provided to the complex organs that make up the orofacial system, which are the nervous, anatomical and physiological unit, located in the cranio-cervical-facial territory, constituted by its different structures, which by means of intelligent products and technologies both minimally invasive and multifunctional will allow reaching large doses of perfection based on the stimulation of the cellular rhythm, in order to combat the causes of aging under a philosophy based on prevention, correction and preservation [13].

The orofacial harmonization as a specialty approved in Brazil and Venezuela opens the way for dentists to perform a series of aesthetic and functional treatments with emphasis on the stomatognathic system [14], which will allow the completion of rehabilitation cases in a comprehensive manner combining aesthetics and functionality [15], restoring the signs of youth that dissipated during the passage of aging, thus adding the bone remodeling that may exist due to the lack of dental elements [16]; following a thorough study and facial analysis [17], which can be achieved through direct visual inspection, radiographs and photographic studies, among others; used as instruments to evaluate the stages of each procedure and the results obtained, as well as to monitor the quality of the method in the tissues [15]. This protocol is a priority not only for the initial registration of the client-patient status, but also for a better assessment of the areas with loss of depth and volume, to appreciate the hemifacial symmetry and tissue displacement [17], for this reason, it should be considered a standardized type of documentation [18].

This being so, it is clear that applying this protocol through a management information system based on the analytical balance from the OROFACIAL HARMONIZATION, makes its use in the field of dentistry and facial aesthetics unprecedented, which facilitates the moment of having an approach by the systematization of the process through the registration and request of all its data, which provides the specialist to have methods that support the functionality of their dental organizations, in addition to getting a way to characterize the facial and oral aesthetic procedures from the perspective of natural beauty and how to relate the coincidences and links from the speech from the needs and desires of clients-patients regarding the procedures that are performed in this professional area. This means that promoting it makes managers' decision making more productive and efficient [19].

Thus, *odontoangela.com* arises as a result of the search for digital technology and telecommunication tools that support the management of the dental client-patient, given the abrupt changes generated by the COVID-19 pandemic, the new SARS-CoV2 coronavirus (Severe acute respiratory syndrome coronavirus) [20], and the creation of the new specialty in dentistry OROFACIAL HARMONIZATION. Thus, teleodontology is gaining strength and becomes one of the first options supported by the telemedicine system where it is possible to perform remote consultations and share digital information such as images, cooperative work, documents, and radiographs, among others [21].

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## 2. Material and methods

After the above, the digital tool of relationship marketing was used, which is part of a management management system that is a set of methods and procedures that collect information from a variety of sources and interact with each other [22]; in order to obtain specific data from customers-patients prior informed consent was obtained from all individual participants included in the study.

The methodology for the development of this software was designed to perform a group of functions, tasks or activities coordinated for the benefit of the user, that is, with systematic quality to devise, implement and maintain a product since its need arises until it fulfills the objective for which it was created [23]. For the purposes of this study, it was applied to a sample of 50 dental patient-clients where it offered its benefits in order to carry out an online evaluation in Valencia, Venezuela. The process of measuring the reliability of the instrument applied in this tool (a rubric created by the author) consists of closed questions of YES and NO and questions with multiple alternatives of two or more alternatives: the alternative answers were presented in which people were circumscribed to them. The instrument was applied to test reliability, which was calculated by applying the Reproducibility Reliability Coefficient [24], which consists of dividing the number of units (item) catalogued with errors by the coder, divided by the total number of units (item) of analysis. An error is an inconsistency and therefore decreases the reliability of the instrument. Thus, 2,650 responses multiplied by 50 subjects x 53 items is the total responses and 1 response with error (1 error is divided by the total responses). Reliability is measured from 0 to 1, and when it equals 0.90 or more and the closer it is to 1, the more reliable it is, as in this case. The instrument has high reliability:

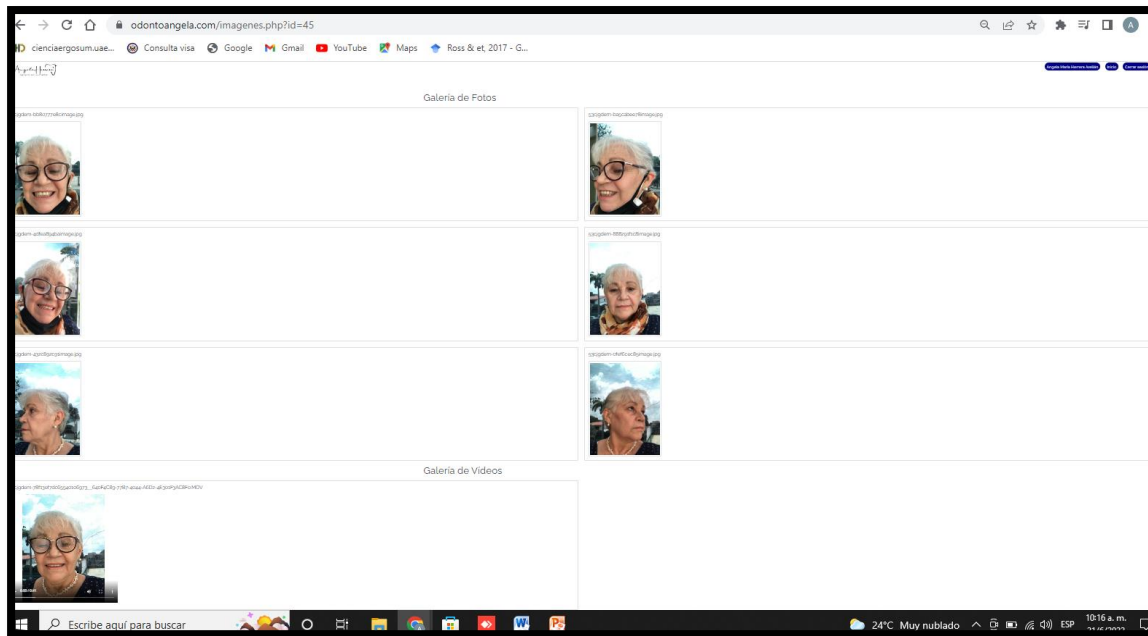
$$Cr = 1 - \text{Number of Errors} / \text{Total Number of Responses}$$

Total Number of Responses = Subjects x Number of Items

$$Cr = 1 - 1 / ((44 \times 50) + (9 \times 50)) \quad Cr = 1 - 1 / (2.650) \quad Cr = 0.9996$$

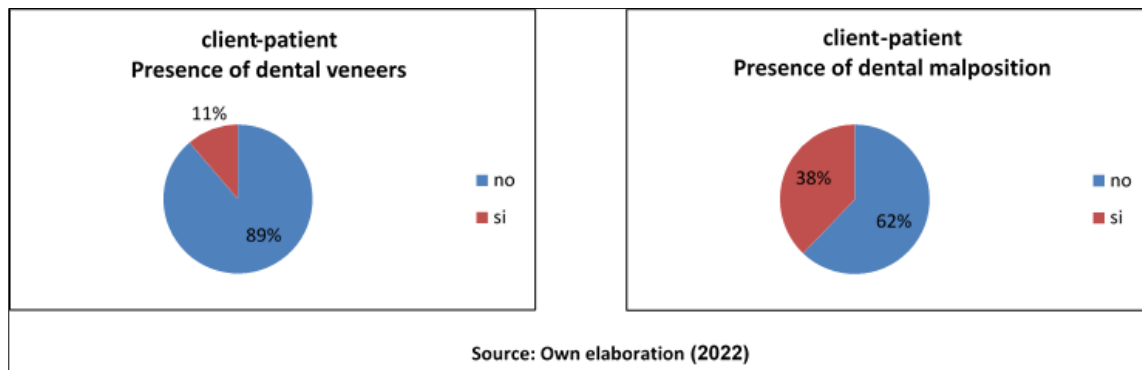
It should be noted that it was easy to access, register and request their data, images and video. Also, to inform each registered user as dentistry has turned to a new paradigm within aesthetics, and that all your data will be safeguarded while maintaining the privacy of the client-patient; expressing that will be used for purposes of creating your medical history, an obligation that is established in the constitution and also covered in the code of medical ethics, so that, your data will not be used without your consent for dissemination or promotion in media and social networks. The following is an image of photographic records and video obtained from a client-patient of the sample described above (see Figure 1).

After the application of the digital tool, a rubric created by the author was used for the analysis of the 50 client-patients based on the requested photographs of the front and right and left profile smile of each client-patient, where the following findings were obtained: on dental characteristics, the presence of hypertrophied/inflamed gums was observed in 2%; visible defective restorations in 12%; noticeable dental absence in 6%; dental veneers in 10%; existence of orthodontics in their smile of 6%; visible deep bite and butt-to-bite in 7%; dental malposition observed in 40%; client-patients with noticeable prosthesis was 4%; and presence of diastemas was 12%. Two of the graphs on dental characteristics observed in the study are presented below (See Figure 2).



Source: Own elaboration (2022)

**Figure 1** Photographic and video recordings



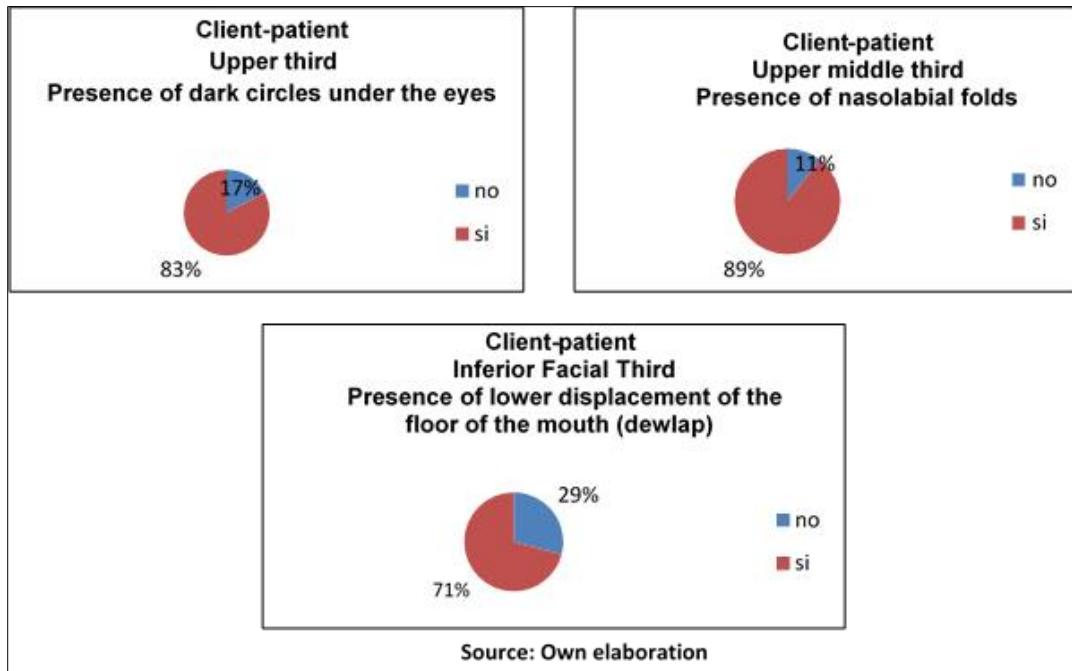
**Figure 2** Dentition characteristics present in photographic records

Then, the results obtained on the clinical characteristics present in the upper facial third of the 50 patient-clients were reasoned by means of the forehead and profile photographs, reaching the following results: presence of asymmetry in 22%; presence of wrinkles in the forehead in 42%; presence of wrinkles in the glabella in 52%; presence of wrinkles in the orbicularis oculi in 56%; presence of drooping eyebrows in 56%; decrease of fatty compartment (temporal cavities) was present in 26%; upper panniculopathic dermatochalasis (ROOF) or (drooping upper eyelid skin) in 72%; the presence of orbital fat herniation (called bags) in 24%; dark circles under the eyes were significantly present in 82%; and finally, the presence of hyperpigmentation in the upper third was 20%.

Likewise, the clinical characteristics in the middle third of the face showed the presence of asymmetry in the middle third in 6%; the presence of nasojugal furrow in 52%; malar festoon in 20%; significantly, the presence of descent of the nasolabial folds (nasolabial folds) in 88%; the drooping of the tip of the nose in 48%; the presence of a wide nasal base in 28%; hyperpigmentation in the middle third was 26%; and telangiectasias in the middle third in 4%.

Finally, in the front and profile photographs of the lower third the clinical characteristics observed revealed: presence of asymmetry in the lower third in 8%; elongated upper lip in 16%; drooping of the angle of the mouth (commissures) and ritides (marionette lines) in 54%; the presence of mandibular jowls in 42%. Likewise, the pronounced labiomental

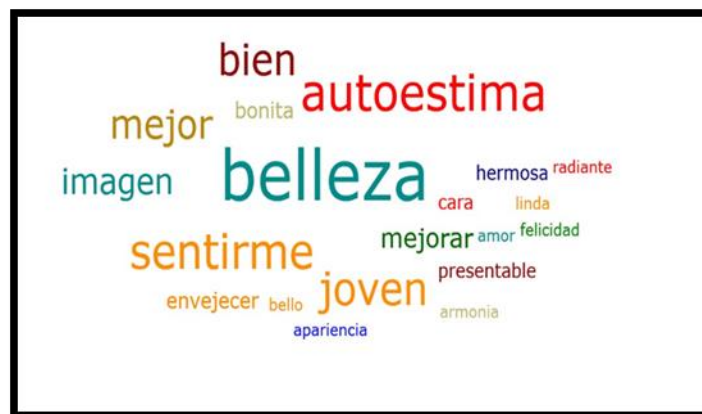
line was present in 26%; lack of chin projection in 14%; lower displacement of the floor of the mouth (jowls) in 74%; loss of definition of the mandibular contour in 56%; hyperpigmentation in the lower third in 10%, and finally, presence of telangiectasias in 4%. The following graphs show the relevance in the upper, middle and lower third (see Figure 3)



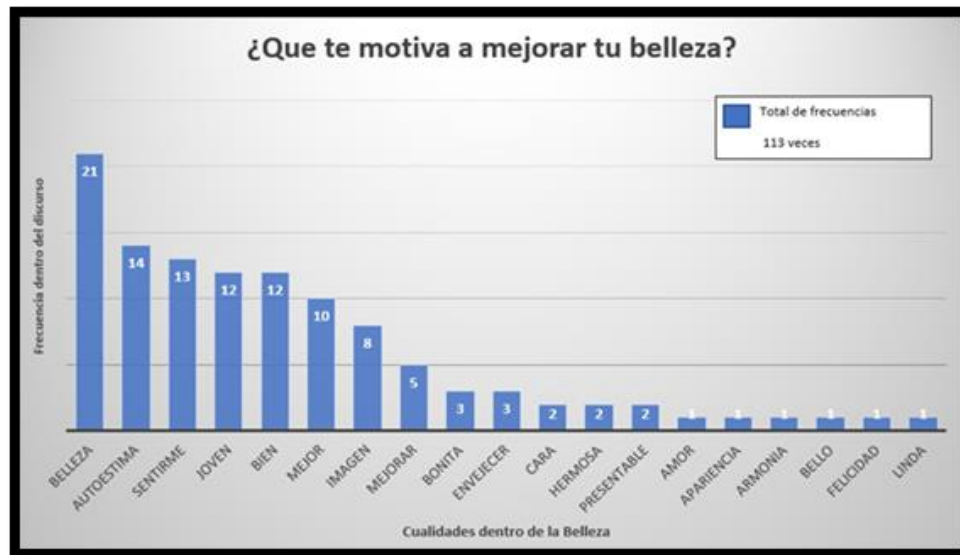
**Figure 3** Clinical characteristics of relevance present in the upper, middle and lower facial third of the photographic records

In the same way, a semantic analysis of the discourse obtained from this same sample (50 dental clients-patients) was carried out by means of three questions that they answered through a video on odontoangela.com, which was then supported by software for qualitative data analysis called Atlas. Ti 9; therefore, the most relevant answer to the following question will be detailed: What motivates you to improve your beauty?

For this purpose, the most prominent in the word cloud was beauty (See Figure 4). Quantitatively, its frequency within the discourse was 113 times, where it was specifically highlighted 21 times (See Figure 5). These findings showed that the categories with respect to the motivation of the client-patients to improve their beauty with the greatest predominance were: beauty, self-esteem, feel myself and young (representing 53% of the total), followed by well, better, image, improve, pretty and aging (See Table 1).



**Figure 4** Word cloud of the question "What motivates you to improve your beauty?"



Source: Own elaboration (2022)

**Figure 5** Frequency within the discourse of clients-patients' motivation to improve their beauty

**Table 1** Quantitative table of words

Palabras	Frecuencia dentro del discurso
Belleza	21
Autoestima	14
Sentirme	13
Joven	12
Bien	12
Mejor	10
Imagen	8
Majorar	5
Bonita	3
Envejecer	3
Total	101

Source: Own elaboration (2022)

### 3. Discussion

Everything described above shows us that the registration of dental and facial photographs in odontoangela.com can allow us to carry out a preliminary evaluation of the oral anatomy to optimize the diagnosis, prognosis and decision making in the treatment protocols.

The results obtained in this study show that the dental and facial appearance changes with age, that the loss of muscle tone and thinning of the skin give the face a flaccid or sagging appearance, the skin around the eyes wrinkles (presents rhytides), creating the so-called goose bumps [25]. Also, fat from the eyelids is deposited in the eye sockets, which causes the eyes to look sunken and bags to develop under the eyes. It is also considered that, progressive retrusion of the midface and shortening of the lower third develop various signs such as flattening of the face, furrows and nasolabial folds, resulting in less exposure of the smile and loss of lip support.

On the other hand, the words expressed by the client-patients showed that beauty for each individual can be different since personalities and tastes change, what for some can be very beautiful, in reality for others it is not; therefore, the demand to rejuvenate the image is closely linked to stereotypes. In short, it can be seen that the changes generated have repercussions on the beauty and self-esteem of the patient-clients.

The purpose is to contribute to the dentist or specialist in this new area through the dynamization of the client-patients by means of communication, knowledge and immediate response generated by the exchange of information through this technological tool and thus perfect the diagnosis with complementary techniques of analysis, in addition to guaranteeing the efficient operation of the organization to sustain a rapid growth of the market for as long as possible [6].

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#### 4. Conclusion

Finally, it is significant to recognize that orofacial harmonization should be approached with multiple strategies since, as a new area of dentistry, the aim is to obtain facial harmony and smile esthetics with previous analysis of the various facial components and their interrelations based on ideal proportions, evaluating their pattern according to the growth and typology of the face. For this reason, it is unprecedented the use of digital technologies that manage the client-dental patient and allow us to approach from the virtuality.

In this perspective, the application of *odontoangela.com* evidenced that it can be a complementary tool for the presumptive diagnosis of facial thirds, in addition to generating a discourse of the client-patient of their needs and desires that are of great importance to develop a future treatment plan, which makes a positive trend with its implementation. However, it can be said that in the coming years the digital alternatives will be marked exponentially, to effectively manage communication with client-patients, so it will be essential to adopt new regulations for its use. Then, obtaining data of the clinical characteristics through the tools of relationship marketing allows us to approach the client-patients before a face-to-face consultation and can make the orofacial harmonizer together with the mixture of the deep knowledge of the structures, the proper management of new technologies can define the corresponding actions to achieve their correct objectives, cataloging it to be more innovative and a potential source to revolutionize the orofacial diagnosis and treatment.

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#### Compliance with ethical standards

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##### *Disclosure of conflict of interest*

No conflict of interest

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#### References

- [1] Enfoque Dental. New dentist-patient relationship. (March 12, 2018); Retrieved March 15, 2022, from Enfoque Dental Management for dentists <https://enfoquedental.com/nueva-relacion-odontologo-paciente/>
- [2] Rodriguez, W., Capote, C., Sanchez, M., & Saquelli, A. (2010). Bioethical considerations in pain management in dentistry. *Acta odontológica venezolana*, 48(4), 1-7.
- [3] Dental, G. What does the future hold for Dentistry? (Feb 02, 2020); Retrieved Mar 16, 2022, from *Gacetadental.com*: <https://gacetadental.com/2020/02/futuro-espera-odontologia-95144/>
- [4] Herrera, A., & Aguirre, N. Management of the Dental Client-Patient as a Dimension of Relational Capital. *Landmarks of Economic Administrative Sciences* 2021; 27(79), 345-370 DOI: <http://ri.ujat.mx/handle/20.500.12107/3786>
- [5] Martinez, d. P. Dental Predictions 2022. (Jan 15, 2022). Retrieved Apr 02, 2022, from *la.dental-tribune.com*: <https://la.dental-tribune.com/news/predicciones-odontologicas-2022/>
- [6] Kotler, P., & Armstrong, G. *Marketing. Latin American version*. 2007. Mexico: Editorial Prentice Hall.

- [7] Largura, L., Ubaldo, M., & Martins, P. A. The Ristow space. Key point in the treatment of the midface. In A. Carbone, & Collaborators, *Orofacial Harmonization. Clinical Cases, Volume 1 2020*; 106-132. Bogotá: Amolca.
- [8] Ministério, d. S. Secretaria de Vigilância em Saúde. Department of Health Situation Analysis Brazil. 2009; Retrieved from [HTTPS://bvsm.s.saude.gov.br/bvs/publicacoes/saude\\_brasil\\_2009.pdf](https://bvsm.s.saude.gov.br/bvs/publicacoes/saude_brasil_2009.pdf)
- [9] Brito, A. (2020). The concept of beauty and Smile: An integrated perspective in the treatment of asymmetries with botulinum toxin and dental contact lenses. In A. Carbone, A. Brito, T. A. Damas, D. A. Gomes, L. R. De Souza, A. Ballarin, et al. *Orofacial Harmonization Clinical Cases Volume 1 (Vol. 1, pp. 19-26)*. Bogota, Colombia: Amolca.
- [10] Tedesco, A., Gomes, D. A., & De Souza, R. (2020). Making Smiles far beyond the teeth. In A. Carbone, A. Brito, A. Damas, D. Gomes, R. De Souza, A. Ballarin, et al. *Orofacial Harmonization Clinical Cases Volume 1 (pp. 46-64)*. Bogota, Colombia: Amolca.
- [11] Lobo, M. Orofacial Harmonization based on Visagism and Facial Analysis. In C. & Collaborators, *Orofacial Harmonization Clinical Cases Volume 1 2020*; 133-160. Bogotá, Colombia: Amolca.
- [12] Carbone, A., Brito, A., Damas, T. A., Gomes, D. A., De Souza, L. R., Ballarin, A., et al. *Orofacial Harmonization Clinical Cases Volume 1 2020*; Bogotá Colombia: Amolca.
- [13] Herrera, A., & Soto, N. Intelligent orofacial beauty: an epistemic reflection from the Venezuelan dental client. *SCIENCE ergo-sum 2022*; 29(2). DOI: <https://doi.org/10.30878/ces.v29n2a11>
- [14] Bazán, J. E. (May 10, 2019). *Dentaldoktor.com*. Retrieved November 26, 2020, from <https://dentaldoktor.com/blogs/noticias/armonizacion-orofacial-una-nueva-especialidad-estetica-para-odontologos>
- [15] Pinheiro, S., & Masson, A. Orofacial harmonization with tissue repositioning and myofunctional balance: a case report. In A. Pereira, A. Carbone, A. Brito, T. Damas, D. Gomes, L. De Souza, ET al. *Orofacial Harmonization Clinical Cases Volume 2 2020*; 194-208. Bogotá-Colombia: Amolca.
- [16] Feres, T., & Pereira, A. (2020). Orofacial harmonization with facial fillers as an adjunct to oral rehabilitation. In A. Carbone, A. Brito, T. A. Damas, D. A. Gomes, L. R. De Souza, A. Ballarin, et al. *Orofacial Harmonization Clinical Cases Volume 1 (pp. 159-168)*. Amolca.
- [17] Saleme, J. E., & Col. (2021). Photographic protocol applied to Orofacial Harmonization. *OROFACIAL AESTHETIC SCIENCE*, 2(1), 72-82.
- [18] Huentequeo-Molina, C., Navarro, P., Vásquez, B., & Olate, S. Facial, dental and radiographic analysis of facial normality: pilot study in 29 women. *International Journal of Morphology 2013*; 31(1), 150-155. DOI: <http://dx.doi.org/10.4067/S0717-95022013000100025>
- [19] Information technologies, T. Management information systems. (2018) Retrieved January 17, 2021, from <https://www.tecnologias-informacion.com/sigerencial.html>
- [20] Chen, N., Zhou, M., Dong, X., Qu, J., Gong, F., Han, Y., et al. (2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *The Lancet*, 395(10223), 507-513. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7)
- [21] Márquez, V. (2020). Teleconsultation in the Coronavirus pandemic: challenges for telemedicine post-COVID-19. *Colombian Rev. Gastroenterology*, 35((Suppl.1)), 5-16. DOI: <https://doi.org/10.22516/25007440.543>
- [22] Peralta, M. (2000). *Information System. El Cid Editor notes*.
- [23] Esteban, G. M., & Pacienza, J. (2015). Digital library of the Universidad Católica Argentina. Retrieved March 5, 2021, from [SOFTWARE DEVELOPMENT METHODOLOGIES: https://repositorio.uca.edu.ar/bitstream/123456789/522/1/metodologias-desarrollo-software.pdf](https://repositorio.uca.edu.ar/bitstream/123456789/522/1/metodologias-desarrollo-software.pdf)
- [24] Hernández, S., Fernández, C., & Baptista, L. (1998). *Research methodology*. Mexico: Mc Graw Hill.
- [25] Garcia, J. (2019). *Facial Aesthetic Medicine. Non-surgical rejuvenation*. Madrid, Spain: Medica Panamericana