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AGE AND AESTHETICS PERCEPTION RELATED TO DIFFERENT TYPES OF ORTHODONTIC DEVICES IN VIEW OF MAXILLOFACIAL RADIOLOGY: A SYSTEMATIC REVIEW

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ABSTRACT

The necessity for orthodontic treatment is significantly impacted by an individual's subjective evaluation of the aesthetic quality of their teeth. In the present study, 62 articles using keywords such as dental anomalies, orthodontics, age, and aesthetics systematically examined age perception and aesthetics related to different types of orthodontic devices were applied. To effectively budget for orthodontic services, it is critical to quantify and communicate the necessity for orthodontic treatment. Findings indicated that employing a blue machine enhances the allure of a smile among youthful male patients, whereas the gray machine evokes the appearance of an elderly man. Orthodontics has a significant effect on

Volumen 15, N° 29. Enero/Junio 2025
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one's visage, despite being one of the most specialized and professional treatments for eliminating and correcting oral and dental issues. Conversely, orthodontic treatment that is executed accurately can enhance the patient's quality of life through the alteration of facial and tooth contours, as well as the improvement of their smile. From a psychological and sociological perspective, the human brain frequently fails to acclimate to the characteristic of having a nose. Furthermore, this characteristic will continue to captivate the viewer's attention and influence those with whom you have a personal or professional connection, even as time passes. Although proper orthodontic treatment does not transform a person's existence, but it influences and improves the quality of the emotions.

KEYWORDS: Age, Orthodontics, Teeth, Smiles, Jaws.

PERCEPCIÓN DE EDAD Y ESTÉTICA RELACIONADA CON DIFERENTES TIPOS DE DISPOSITIVOS DE ORTODONCIA EN VISTA DE LA RADIOLOGÍA MAXILOFACIAL: UNA REVISIÓN SISTEMÁTICA

RESUMEN

La necesidad de un tratamiento de ortodoncia se ve significativamente afectada por la evaluación subjetiva que hace un individuo de la calidad estética de sus dientes. En el

presente estudio, se aplicaron 62 artículos que utilizaban palabras clave como anomalías dentales, ortodoncia, edad y estética y examinaron sistemáticamente la percepción de la edad y la estética relacionada con diferentes tipos de dispositivos de ortodoncia. Para presupuestar eficazmente los servicios de ortodoncia, es fundamental cuantificar y comunicar la necesidad de tratamiento de ortodoncia. Los hallazgos indicaron que el uso de una máquina azul mejora el atractivo de una sonrisa entre los pacientes varones jóvenes, mientras que la máquina gris evoca la apariencia de un hombre mayor. La ortodoncia tiene un efecto significativo en el rostro, a pesar de ser uno de los tratamientos más especializados y profesionales para eliminar y corregir problemas bucales y dentales. Por el contrario, un tratamiento de ortodoncia ejecutado con precisión puede mejorar la calidad de vida del paciente mediante la alteración del contorno facial y dental, así como la mejora de su sonrisa. Desde una perspectiva psicológica y sociológica, el cerebro humano frecuentemente no logra aclimatarse a la característica de tener nariz. Además, esta característica seguirá cautivando la atención del espectador e influyendo en aquellos con quienes tienes una conexión personal o profesional, incluso a medida que pasa el tiempo. Aunque un tratamiento de ortodoncia adecuado no transforma la existencia de una persona, sí influye y mejora la calidad de las emociones.

PALABRAS CLAVE: Edad, Ortodoncia, Dientes, Sonrisas, Mandíbulas.

INTRODUCTION

Volumen 15, N° 29. Enero/Junio 2025
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Age and aesthetics with various types of orthodontic devices were systematically analyzed in this research study through an examination of over sixty articles containing the keywords dental anomalies, orthodontics, age, and aesthetics. Orthodontic types include:

1. Fixed orthodontics: Standard braces are made up of metal wires and brackets that are fixed on the teeth to direct them to a better position [1].

2. Damon Orthodontics: Damon Orthodontics uses different technology, sliding slippage mechanism, and replaces usual wired brackets. As a result, the duration and pace of the treatment are accelerated, and the patient experiences reduced discomfort. The Damon system applies more intense forces to teeth that exhibit more pronounced irregularities [2].

3. Lingual orthodontics: Lingual orthodontic devices are placed behind the teeth and are therefore invisible. The orthodontic mechanism of the lingual (linguistic back) and metal orthodontics is the same, apart from the wiring being behind the tooth [2].

4. Invisible orthodontics: Invisible Transparent Orthodontic Plaque gradually moves the teeth to a better position. This technique employs a set of decals made of transparent plastic that adhere well to the teeth. A novel plaque is presented to the patient on a biweekly basis instead of wire tightening, to progressively realign the teeth [3].

5. Movable orthodontics: In certain instances, moving orthodontics may be advised by specialists to rectify bicuspid disorders, the influence on the development of children's mandibles, and a variety of preservative plaque. Proficiency in the utilization of movable orthodontics and effective scheduling are essential factors that determine the outcome of treatment [4].

Methodology

Volumen 15, N° 29. Enero/Junio 2025
Depósito Legal: PPI201102ME3815
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By systematically examining over sixty articles containing the keywords dental anomalies, orthodontics, age, and aesthetics in relation to various types of orthodontic devices, the present study investigated age perception and aesthetics. To organize orthodontic services, it is extremely beneficial to measure and report the need for orthodontic treatment (Figure 1).

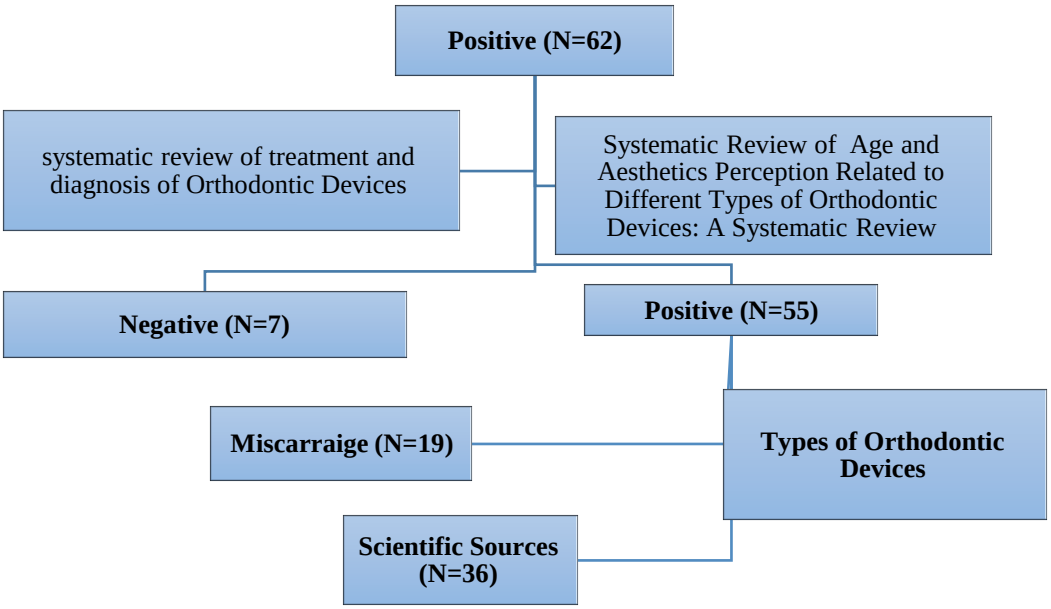

Figure 1. Flow chart of included subjects

Steps and duration of orthodontics

Volumen 15, N° 29. Enero/Junio 2025
Depósito Legal: PPI201102ME3815
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The patient must first be examined for orthodontic treatment to raise the teeth. A competent orthodontist directs the fabrication of radiographs (panoramic and cephalometric) and photographs (using a standard photography camera) following the examination [4]. Initial molding may also be performed by some orthodontists during the examination session. Following the orthodontic practitioner's review of these documents, a written treatment plan is formulated for each patient and subsequently communicated to them. If the patient is accepted by the treatment process, the orthodontic brackets for the wire will begin. The steps are:

1. Radiography and molding;
2. Early action [5];
3. Putting the brace;
4. Setting a fish once;
5. Brace [6];
6. Plating the plaque.

Duration: The length of orthodontic treatment is not the same for all patients; Correcting some problems is more time-consuming, and orthodontics takes about two years on average. However, the average problem can be cured by an orthodontist within six months [4], whereas the modification of more complex issues can take three years or longer [5]. The dentist is the most reliable and accurate source of information regarding the duration of orthodontic treatment. Several factors have a substantial influence on an individual's visage and counticuli, including the nature and quantity of anomalies and problems they possess. Whether the teeth are exceedingly disorganized, or the jaw is positioned too far forward or backward, they have the potential to impact all aspects of the face, including the appearance of the smile. Orthodontic treatment by returning teeth and jaws to their original position can bring a wonderful change to the face shape [6].

The effect of age on orthodontics

Volumen 15, N° 29. Enero/Junio 2025
Depósito Legal: PPI201102ME3815
ISSN: 2244-8136

There is no age restriction for orthodontics, and this does not require a teenager or child. In certain individuals, dental orthodontics may be necessary when the teeth fail to meet at the appropriate angle or are extremely near together. Such circumstances necessitate orthodontic treatment, which can be initiated at any stage of development referred to as the "orthodontic age" for such teeth [7]. Individuals who possess a robust jaw foundation and healthy gums may not be able to prevent dental issues at a young age by adhering to the orthodontic age. Although dental orthodontic treatment can significantly improve appearance, particularly smiles, it is not the most crucial aspect of orthodontic age; rather, it is the health of the gums and teeth [8].

When is the best orthodontic age? There are three distinct phases in the evolution and development of the pediatric oral system: the dairy tooth period, the various tooth periods, and the permanent tooth period. The optimal orthodontic age for most children without mandible issues is later (when using a different toothpaste). Orthodontic treatment is feasible for individuals of any age, provided that the teeth and preservative tissues remain healthy. However, as a result of alterations in the bones, the treatment would last longer than in infants [9].

Findings

The difference between anterior facial height and anterior/posterior facial height and gonial angle, SNB, overjet, mouth breathing, gingivitis snoring, posterior crossbite in groups with large adenoid and normal adenoid was significant ($P<0.05$). Conclusion: The findings show that the size of the adenoid causes changes in the jaw, face and mouth area, which will affect the function and beauty of this area of the body. The severity and trend of these changes depends on the size of the adenoid, the length of the

Volumen 15, N° 29. Enero/Junio 2025
Depósito Legal: PPI201102ME3815
ISSN: 2244-8136

period of changes and the duration of oral breathing created in balance with the protective mechanisms of growth and development and the methods of prevention and intervention of the doctor in solving the causes of adenoid enlargement [10].

Adult tooth problems: Treatment and teeth are possible at an older age. It is only longer due to bone changes. The orthodontic treatment and redesign of the smile contribute to the enhancement of individuals' beauty and confidence. There are two distinct treatment modalities for adult jaw disorders, which are determined by the severity of the abnormalities and growth patterns: (Orthodontic strategy without surgery) and (orthodontic with jaw surgery) [11].

What is invisible orthodontics?

An element to be considered in invisible orthodontics is the use of a fixed orthodontic machine, which is typically composed of a common metal. Adults are particularly sensitive to the age and occupation of those who operate such devices, which has prompted the development of less invisible bus techniques. Those that are called invisible orthodontics [12]. Fixed or removable, these orthodontic systems fall into three distinct categories: those utilizing translucent removable brackets, those employing orthodontic lingual from the back of the tooth, and those utilizing removable brackets. Thus, it can be deduced that the charter currently does not impose an age restriction and that orthodontic issues can be categorized as either dental or skeletal in nature. The age restriction in the group with dental abnormalities does not preclude the use of orthodontic treatment for the health of dental preservative tissues at any stage of life [13]. A reduction in cellular metabolism and an increase in bone density will inevitably result in an extension of the orthodontic treatment period. Intervention is advised for patients in the group (jaw) whose upper

Volumen 15, N° 29. Enero/Junio 2025
Depósito Legal: PPI201102ME3815
ISSN: 2244-8136

mandible is retracted, with a recommended age range of 8 to 10 years, during the period of maxillary growth. The jaw skeleton can be directed during the period of jaw development, which reduces the likelihood that advanced procedures, such as orthodontics, tooth extraction, or orthodontics with jaw surgery, will be necessary in the future. However, it is still possible to achieve mild to moderate jaws even in older patients through orthodontic-dental relationships; extensive skeletal ablution will continue to be addressed through jaw surgery and orthodontic treatment [14]. Thus, orthodontic treatment is not restricted to a specific age group; rather, addressing orthodontic issues in an opportune manner can enhance both the efficacy and timeliness of treatment [15].

Orthodontic impact on the chin

You have probably seen or heard that a great number of individuals undergo chin surgery to enhance the beauty of their features. The chin is one of the most important facial members, and if the changes are made to the lower jaw, the jaw state will undergo many changes. Also, if the jaw is tilted, it has a significant impact on the skin under the chin and can make the face younger [16]. However, the only solution is not surgical, and orthodontics can be the most suitable solution in most cases. One of the greatest impacts that orthodontics can apply to the chin is visible by the treatment of ander bite abnormalities (excessive jawbone). If the mandibular teeth are leaning out, they can show the face too round and orthodontics will fix this problem [17-19].

Orthodontic impact on the nose

Numerous individuals inquire whether orthodontic treatment can have an impact on the nostrils. Additionally, whether the rhinoplasty should be performed prior to or after orthodontics is a crucial inquiry. While orthodontics does not directly influence the shape and form of the nose

[18-20], it can significantly influence the overall facial structure through nasal positioning [20]. It is important to note that modifications made to the maxilla do not have a negative impact on nasal positioning. Therefore, individuals who wish to perform nose work should delay doing so until the orthodontic phase concludes [21].

Orthodontics on the jaw

The position and position of the teeth in the mouth directly affect the shape and shape of the jaw. The use of orthodontic devices at an early age can be effective and efficient for the treatment and relocation of the jaws [22], preventing the person in the future not face their jawbone problems. However, as the age and the completion of the jawbone growth and, in fact, in adulthood, this is not possible without the help of jaw surgery [23].

Orthodontic effect on lips during treatment

The potential need to alter one's lips after the placement of orthodontic braces on the teeth is a matter of concern for individuals contemplating orthodontic treatment [24]. Undoubtedly, concerns are unwarranted, as the outcome achieved after treatment is considerably more significant and valuable, rendering the ordeal per severable [25].

Discussion

Lesions were most frequent in the age group of 20 to 39.9 years. Lesions were generally more frequent in females. The most frequent types of lesions were, respectively, epithelial lesions, developmental defects, excitatory lesions and soft tissue tumors [26]. Typically, orthodontic treatment is advised to begin during adolescence or early childhood [27]. It is now possible to modify and direct the molars into the desired position. However, early-stage orthodontic treatment may be feasible, albeit

necessitating lengthier and more specialized routines [28-30]. In adolescence and adolescence, teeth and jaws are still growing. This makes it easier to move and adjust the teeth during this time. As a result, the onset of orthodontic treatment at this age can lead to better results [30]. Every person may have different therapeutic needs. While some individuals may benefit from more straightforward environments, in some instances they may necessitate more comprehensive intervention. After a thorough assessment and evaluation by an orthodontist or dentist, dental wiring may be deemed appropriate [31]. If at the time of the first examination, the orthodontist realizes that the authorities have jaw anomalies, depending on the type and amount, it begins before puberty. It is important to remember that in such situations, the orthodontist must perform mandible surgery [32].

- Girls from the age of 8;
- Boys from the age of 9.

However, the treatment can be started earlier at the discretion of the specialist. If a person does not refer to this problem on time, they will need jaw surgery at an older age. What is certain is that orthodontics prevented and early have undeniable benefits [33]. A pediatric dentist is often the first person to notice the problem of teeth during periodic visit sessions and recommends referring to an orthodontist. The specialist examines the necessity of dental wiring and offers the best orthodontic time and the most appropriate method and orthodontic methods [34].

1. Improving the beauty and appearance of a smile: Orthodontics smooth irregular teeth and help people to make a more beautiful smile [35].

2. Increasing Chewing Performance: Teeth and jaw modification help improve chewing function and reduce pressure on the teeth [36].

3. Prevention of dental and gum problems: Regular teeth are better

cleaned, which reduces the risk of tooth decay and gum disease [37].

4. Reducing abnormal teeth abrasion: Orthodontics can prevent excessive teeth abrasion caused by improper location [38].

5. Improving pronunciation and talking: Modifying dental and jaw abnormalities can help improve pronunciation and clarity [39].

6. Reduce maxillofacial pain and temporomandibular joint problems (TMJ): Orthodontics can be effective in correcting jaw problems and reducing the pain [40].

7. Increasing self -esteem: Improving the beauty of a smile can have a positive effect on one's self-esteem and mental image [41].

8. Prevention of dental damage: The properly arranged teeth are less likely to be physical injuries [42].

9. Promotion of oral health: Treatment success by an orthodontist facilitates and improves the ability to sanitize teeth and gums. In addition to reducing the accumulation of food particles, brushing significantly diminishes the risk of developing cavities, plaque, and periodontal disease [43].

10. Physical Benefits of Orthodontics: At the physical level, the effects of this treatment also reach the patient's shoulders and neck. Pain in the jawbone, which may originate from dental irregularities, has the potential to be transmitted to the neck and shoulders due to the proximity of this bone to these areas. Therefore, one of the advantages of effectively treating dental issues will be the alleviation of discomfort in the shoulders and neck [44].

11. Preventing other health problems: In addition to the benefits of orthodontic physical and mental health, it also enhances health in other ways [45]. When oral health is in trouble, bacteria may reach the bloodstream [46]. This reduces the efficiency of the immune system and increases the risk of disease. Diabetes and heart disease are examples of these problems. Teeth orthodontics prevents

this, reduces such risks, and can even help reduce pregnancy complications [47].

12. Improving sleep quality: After treatment, the patient's sleep quality will also improve. In cases where teeth protrude or mandible alignment is compromised, orthodontic treatment can significantly improve the quality of one's nighttime sleep [48].

13. Improvement of mental health: There are additional advantages to this treatment beyond its somatic effects. Unsuitable dentition and a tilt can undermine confidence [49]. To the degree that engaging in conversation and beaming causes you discomfort [50-52]. Which orthodontic interventions are effectively eradicated?

Those who have problems only with their teeth can apply for orthodontics at any age. Of course, they need to have no problem with the gums and bones. The best age for orthodontics is from 10 to 12 years. During this period, almost all teeth are permanent (except for the teeth of wisdom and large Asia) [53]. By taking proactive measures at this stage of life, one can avert subsequent complications [54]. Due to the fact that orthodontic treatment should not be initiated until the inappropriate time, greater caution is advised in the future, particularly after the age of 30. At this age, jawbone analysis can cause obstacles [55].

Can orthodontics be used only at the age of growth? The best age for orthodontics is adolescence. But if the gums and jaws are healthy, this treatment can be used at other ages [56].

Why is it very important in the treatment of jaw anomalies? This abnormality, which is recognizable from childhood, can be treated in simple ways at the same time. However, surgical intervention is necessary if this condition is not addressed promptly [57]. Age should therefore be a significant factor in the treatment of this condition [58].

Volumen 15, N° 29. Enero/Junio 2025
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ISSN: 2244-8136

Is orthodontics better at an early age? No, if there are numerous issues and abnormalities, it is preferable to begin orthodontic treatment during childhood. Otherwise, it is best to delay treatment until after puberty due to factors such as children's lack of cooperation with the specialist, inadequate development of the teeth and jaw at a young age [59-61], and the psychological impact and diminished self-esteem that may result. Early treatment initiation may result in additional interventions and treatments in certain instances [62].

Table 1. Forest plot showed the Age and Aesthetics Perception Related to Different Types of Orthodontic Devices

Raw	Study	Year		Proportion Wight 98%		Weight %
1	Mauras et al.	**2015**		0.92	[0.39 – 1.06]	5.03
2	Nokoff et al.	**2019**		0.87	[0.54 – 1.02]	6.02
3	Tanaka et al.	**2001**		0.88	[0.63 – 1.01]	5.57
4	Antunes et al.	**2009**		0.60	[0.25 – 1.08]	6.13
Heterogeneity t^2=0.02, I^2= 0.00, H^2=1.02				0.95	[0.22 – 1.07]	
Test of Θ= Θ, Q (4) =5.55, P= 0.74						
1	Rodríguez et al.	**2017**		0.84	[0.27 – 1.08]	6.08
2	Yasrebinia et al.	**2024**		0.76	[0.52 – 0.22]	5.82
3	Otaghvar et al.	**2023**		0.11	[0.54 – 0.89]	5.85

4	Naghdipour et al.	**2022**		0.39	[0.12 – 0.99]	6.09
Heterogeneity t^2=0.14, I^2= 0.11, H^2=0.42				0.77	[0.19 – 1.00]	
Test of Θ= Θ, Q (4) =3.35, P= 0.34						
1	Naghdipour et al.	**2021**		0.92	[0.39 – 1.06]	3.03
2	Motamedi et al.	**2023**		0.87	[0.54 – 1.02]	8.33
3	Milanifard et al.	**2021**		0.99	[0.63 – 1.01]	7.50
4	Kheradjoo et aL.	**2022**		0.68	[0.25 – 1.08]	6.03
Heterogeneity t^2=0.14, I^2= 0.00, H^2=1.02				0.87	[0.22 – 1.07]	
Test of Θ= Θ, Q (4) =3.55, P= 0.12						

Conclusion

It is considerably simpler, according to experts, to resolve dental issues in minors as opposed to adults. The structures comprising the teeth, jaws, and mouth of juveniles are still developing and malleable. This causes children's problems to be resolved in a short time without discomfort and is much more effectively. Additionally, children have significantly reduced orthodontic treatment costs than adults. However, since the growth of adult bones and teeth has stopped, it is very difficult to smooth their teeth or jaws. It may take a long time and cost a lot. Thus, one distinction between orthodontics for children and those for adults is the severity and nature of their issues, while the other is the utilization of orthodontic devices. Dental standards can facilitate toothbrush and brushing access to teeth. This may result in dental caries. By preventing tooth

Volumen 15, N° 29. Enero/Junio 2025
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decay and modifying dental abnormalities, orthodontics can facilitate access to decay. Early stages of tooth degeneration are typically managed with dental fillings. Advanced stages may necessitate the extraction of a tooth or teeth. One advantage of having teeth and mandible aligned in the same direction is not only a more refined smile.

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