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An Overview of Improving Smile Aesthetics: A Literature Review

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Abstract

Smile aesthetics is a fundamental determinant of facial attractiveness, social interaction, and self-perception. Beyond being a visual element, a harmonious smile contributes significantly to self-confidence, psychosocial well-being, and quality of life. Patients increasingly seek not only functional correction but also treatments that enhance their overall facial harmony. Consequently, modern dentistry has adopted an interdisciplinary approach, where multiple specialties collaborate to deliver comprehensive care. Orthodontics occupies a central role in this process by ensuring proper alignment, occlusal balance, and symmetry of the dentition. Correcting malocclusions such as deep bite, open bite, and crowding not only improves function but also enhances aesthetic integration with the lips and facial profile. Periodontology contributes by maintaining gingival health and achieving ideal gingival contours, which are essential for a natural smile line. Restorative dentistry and prosthodontics restore defective, missing, or malformed teeth, ensuring shape, color, and proportion harmonize with adjacent structures.

In cases of skeletal discrepancies, oral and maxillofacial surgery provides corrective interventions, allowing orthodontic and prosthetic treatments to reach their full aesthetic potential. Technological advancements further enhance treatment precision. Digital tools, including intraoral scanning, 3D facial imaging, and cephalometric analysis, enable detailed diagnosis and individualized planning. Smile design software allows clinicians to simulate outcomes, improving communication between the dental team and the patient. Such tools also facilitate minimally invasive approaches, aligning patient expectations with realistic results. Ultimately, optimal smile aesthetics can only be achieved through close interdisciplinary collaboration. Each specialty contributes unique expertise, but their integration ensures outcomes that are not only visually pleasing but also stable, functional, and biologically sound. This literature review highlights the significance of combining orthodontics, periodontology, restorative dentistry, prosthodontics, and surgical approaches with advanced digital diagnostics. Together, these strategies maximize patient satisfaction, enhance psychosocial well-being, and establish smiles that embody both function and beauty.

Keywords

Interdisciplinary Communication; Aesthetics; Cosmetic Dentistry; Orthodontics; Smiling.

Introduction

A smile is a fundamental element of facial aesthetics, strongly influencing self-confidence, social acceptance, and interpersonal relationships. Beyond physical appearance, research has shown that an attractive smile enhances psychosocial well-being, fosters trustworthiness, and promotes positive social interactions [1]. Enhancing smile aesthetics can therefore improve individuals' self-perception and quality of life [2].

The aesthetic value of a smile depends on the harmonious integration of multiple factors, including dental proportions, lip posture, gingival display, and overall facial balance. Sabri (2005) identified eight key components of smile aesthetics: lip line, smile arc, upper lip curvature, lateral negative space, smile symmetry, frontal occlusal plane, dental components, and gingival components [2] (Figure 1). These elements vary by age and gender, as younger individuals typically exhibit a higher lip line and greater gingival display, which are associated with youthful appearance, while aging often reduces incisor visibility [2].



Figure 1: Ideal smile created by artificial intelligence.

In orthodontics, smile analysis is recognized as distinct from cephalometric and model analysis, requiring careful evaluation of static and dynamic features such as natural versus posed smiles [3]. Treatment planning must therefore consider not only tooth alignment and occlusion but also facial harmony and functional balance [4,5]. Achieving an aesthetically ideal smile often requires a multidisciplinary

approach, with orthodontists, periodontists, restorative dentists, prosthodontists, and oral and maxillofacial surgeons working collaboratively to address both aesthetic and functional needs [6,7].

General Information

Fundamental concepts in smile aesthetics

Aesthetics, derived from the Greek word *aisthētikos*, refers to the perception and appreciation of beauty [7]. In dentistry, smile aesthetics involves achieving harmony between teeth, gums, lips, and facial features. Disproportionate or asymmetric components disrupt this harmony, whereas balanced proportions are generally accepted as a criterion of beauty [8].

Several anatomical structures influence smile aesthetics, including the teeth, gingiva, periodontal tissues, and lips. Morley and Eubank classified smile design into four dimensions: gingival aesthetics, facial aesthetics, macro-aesthetics, and micro-aesthetics. Key dental parameters include tooth size, shape, color, alignment, crown angulation, and midline symmetry [9]. The midline, in particular, is critical for balance and is a primary objective of orthodontic treatment. Studies show that minor deviations or diastemas may not be noticed by laypeople unless they exceed 3–4 mm, though dental professionals detect asymmetries earlier. Similarly, the degree of overjet and overbite significantly influences aesthetic perception, with moderate overbite often considered most attractive [10-13].

Other determinants include lip posture and incisor display, both of which vary with age and gender. Younger individuals typically display more maxillary incisors and a higher lip line, contributing to a youthful appearance. Tooth proportions, especially the width-to-height ratio of central incisors, also affect attractiveness; values between 75% and 85% are generally considered optimal. The application of aesthetic principles such as the golden ratio and the 50:40:30 contact point rule provides clinicians with guidelines for balanced tooth proportions, though flexibility is essential to avoid overly rigid outcomes [14,15].

Interdisciplinary approaches to smile aesthetics

While orthodontics forms the foundation of smile design by aligning teeth and correcting malocclusions, optimal results often require collaboration with other dental disciplines. Prosthodontists restore or replace missing teeth with prosthetic solutions such as implants, bridges, or dentures. With the aid of CAD/CAM (Figure 2) and digital smile design technologies, prosthodontists can create highly individualized and lifelike prostheses that restore both function and appearance [16-18].



Figure 2: Rehabilitation of aesthetically compromised maxillary anterior teeth with current technologies. Preoperative intraoral situation (A). Natural tooth shapes from a digital tooth library were selected (B) to fabricate CAD/CAM laminate veneers. Postoperative situation (C). CAD, computer-aided design; CAM, computer-aided manufacturing [18].

Periodontists focus on the gingival framework, which plays a vital role in framing the smile. Procedures such as gingival contouring, crown lengthening, and grafting address conditions like excessive gingival display or recession, ensuring aesthetic balance between teeth and soft tissues. Advances in laser-assisted surgery and digital planning have further improved precision and recovery outcomes [16,19,20].

Restorative dentistry complements orthodontic and prosthodontic treatments by addressing issues such as discoloration, wear, and shape discrepancies. Techniques including veneers, composite bonding, and ceramic restorations help refine tooth morphology and color, ensuring harmony with adjacent teeth. These interventions provide the finishing touches to an aesthetic smile by enhancing symmetry and balance [17].

Oral and maxillofacial surgeons contribute to smile aesthetics by correcting skeletal discrepancies and placing implants in areas of tooth loss. In cases requiring orthognathic surgery, repositioning the maxilla or mandible helps establish both functional occlusion and improved facial harmony, which are essential for a balanced smile [21].

The role of orthodontics

Orthodontists remain central to the aesthetic smile framework, as their work lays the foundation for subsequent restorative or prosthetic procedures. By creating an ideal smile arc and ensuring harmony with the lips and facial profile, orthodontic treatment improves both static and dynamic aspects of the smile (Figure 3). Beyond alignment, orthodontics addresses functional stability, preventing complications such as enamel wear or bite dysfunction. This holistic perspective highlights that smile aesthetics is not simply about straight teeth, but about integrating dental, gingival, and facial elements into a balanced whole [22,23].

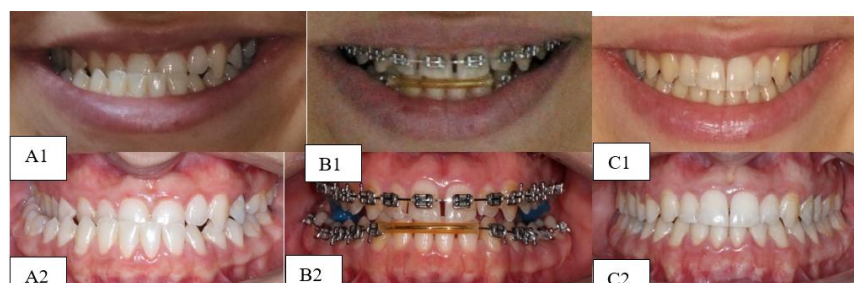


Figure 3: The patient presents with an anterior crossbite. The initial smile and intraoral photographs demonstrate that the smile is not an optimal aesthetic presentation (A1, A2). In the case of the female patient, the anterior crossbite was corrected through the implementation of an orthodontic treatment plan (B1, B2). The desired aesthetic outcome was achieved through the use of fixed orthodontic treatment (C1, C2).

Current developments

As in every field, augmented reality is being used to improve smiles. One study found that using Augmented Reality (AR), new digital technologies offer the option of making an instant diagnosis and visualizing the potential outcome before starting treatment. It combines AR with CAD/CAM technology and is expected to be both time- and cost-effective. This patient-centered approach involves the patient

from the very beginning, making it an excellent communication tool between the patient and the team [24]. Artificial intelligence (AI) applications are becoming increasingly common in smile design and aesthetic procedures. The current prevalence and performance of AI models in digital smile design applications have not yet been systematically documented and analyzed. Studies have evaluated the performance of AI models in smile design, benchmarking criteria using AI analysis, and the performance of various AI software programs, demonstrating their success [25].

Conclusion

Smile aesthetics represents a multifaceted concept that extends beyond tooth alignment, encompassing the harmony of lips, gingiva, periodontal tissues, and facial structures. Achieving an aesthetically pleasing and functional smile requires the integration of multiple parameters, including the golden ratio, midline alignment, overjet, overbite, and maxillary incisor display. These factors, when assessed holistically, provide the foundation for balanced and individualized treatment outcomes.

Interdisciplinary collaboration is essential in this process. Orthodontists correct misalignments and establish the structural framework, periodontists ensure gingival health and contour, prosthodontists and restorative specialists restore or replace teeth for both function and appearance, and oral surgeons address skeletal discrepancies. This collaborative approach enables clinicians to design treatment plans that are tailored to the unique needs of each patient, ensuring harmony between dental, periodontal, and facial components.

Ultimately, improving smile aesthetics does not merely enhance appearance; it contributes to patients' oral health, functional stability, psychosocial well-being, and long-term satisfaction. By integrating traditional aesthetic principles with modern digital technologies, dentistry continues to evolve toward delivering individualized, durable, and aesthetically harmonious smiles.

Authorship contributions

Concept: Karadede Ünal B., Karadede B., Karadede M.İ.; Design: Karadede Ünal B. Karadede M.İ.; Supervision: Karadede B. Karadede M.İ.; Materials: Çardak D., Koyu Z., Data: Çardak D., Koyu Z., Analysis: Çardak D., Koyu Z., Literature search: Çardak D., Koyu Z., Writing: Çardak D., Koyu Z., Karadede Ünal B., Karadede B., Karadede M.İ.; Critical revision: Karadede B., Karadede M.İ.

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