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Aesthetic And Psychosocial Aspects In Orthodontics-A Review

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Abstract

Malocclusion and dentofacial anomalies impact not only oral function but also dental aesthetics and psychosocial well-being. The relationship between clinical orthodontic needs and patients' psychological profiles plays a crucial role in shaping both the motivation for seeking treatment and the perceived outcomes. This paper explores aesthetic perceptions, psychosocial functioning, and self-esteem in relation to malocclusion, while also reviewing validated assessment tools, examining evidence on treatment effects, and discussing the associated clinical and ethical implications. A narrative synthesis of literature published between 2000 and 2025 was conducted, including cross-sectional, cohort, and longitudinal studies that evaluated aesthetic concerns, self-esteem, quality of life, and treatment satisfaction among orthodontic patients. The findings indicate that dental aesthetics serve as a primary motivator for orthodontic treatment and are strongly linked to self-esteem, social confidence, and oral-health-related quality of life (OHRQOL). Validated instruments such as the Index of Orthodontic Treatment Need–Aesthetic Component (IOTN-AC), Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ), Rosenberg Self-Esteem Scale (RSES), and Child Oral Health Impact Profile (COHIP) demonstrate strong psychometric validity and reliability. While clinical indices of malocclusion severity show moderate correlations with psychosocial effects, individual psychological factors often exert a stronger influence on patients' experiences and treatment outcomes. Orthodontic interventions have been shown to produce significant improvements in self-esteem, social functioning, and emotional well-being; however, these benefits are influenced by factors such as patient communication, treatment expectations, demographic characteristics, gender, cultural perceptions of beauty, and previous orthodontic experiences. Overall, a biopsychosocial approach that integrates objective clinical assessments with validated patient-reported psychosocial measures provides a more holistic, ethical, and patient-centered framework for orthodontic care. Future research should focus on culturally diverse populations and the long-term psychosocial outcomes of orthodontic treatment, particularly as patients transition into adulthood.

Keywords: Malocclusion, Dental aesthetics, Psychosocial impact, Patient satisfaction, Social confidence, Emotional well-being.

1.Introduction

Malocclusion—misalignment or incorrect relation between the teeth of the two dental arches—can detrimentally affect function, facial aesthetics, mental health, and social interactions¹. While orthodontics has historically been framed in functional and structural terms, rising psychosocial awareness and aesthetic self-consciousness have catalyzed a broader shift in clinical focus, especially among adolescents and young adults^{2,3}.

The aesthetic dimension of a smile is often what initiates treatment-seeking behavior. Aesthetic components of indices like IOTN-AC are widely used in both clinical assessment and aesthetic motivation⁴. Simultaneously, poor dental aesthetics and untreated malocclusion have been linked to diminished self-esteem, social anxiety, and bullying experiences in youth⁵. Self esteem of the patients was significantly improved after orthodontic treatment because a smile plays an important part in facial expressions⁶

This review aims to examine aesthetic considerations and indices in orthodontics, explore psychological constructs and their measurement, evaluate psychosocial impact pre- and post-treatment. Identify mediating and moderating variables, and discuss clinical and ethical implications.

2.Aesthetic Indices and Clinical Correlations

Index of Orthodontic Treatment Need (IOTN)

The IOTN includes two components:

- **Aesthetic Component (AC)** provides a subjective assessment of the aesthetic and psychosocial impact of malocclusion by evaluating how unattractive the dental appearance is perceived to be. It uses a visual scale of 10 standardized photographs, which can be rated either by the patient or the clinician to gauge the degree of aesthetic concern.
- **Dental Health Component (DHC)** offers an objective clinical evaluation of malocclusion severity based on its potential or actual risks to dental health. The clinician examines features such as overjet, crossbite, open bite, crowding, displacement, and impaction, assigning a grade from 1 (no treatment need) to 5 (very great treatment need).

IOTN-AC correlates strongly with psychosocial distress, frequently more so than DHC^{7,8,9,10} making it a valuable tool for patient-centered aesthetic evaluation.

Dental Aesthetic Index (DAI)

DAI combines dental measurements (e.g., spacing, crowding, overjet) with aesthetic considerations, producing a normative treatment need index. Severity measured by DAI shows moderate correlation with psychosocial impact^{11,12} but its integration with patient-perceived aesthetics is limited.

Psychosocial Measures

- PIDAQ (Psychosocial Impact of Dental Aesthetics Questionnaire): Measures aspects such as dental self-confidence, social impact, psychological impact, and aesthetic concern¹³.
- RSES (Rosenberg Self-Esteem Scale): A globally used measure of baseline self-esteem.
- COHIP (Child Oral Health Impact Profile): oral-health-related quality of life (OHRQOL) measure tailored for adolescents, often paired with Psychosocial Impact of Dental Aesthetics Questionnaire(PIDAQ)¹⁴.

These instruments offer validated psychometric properties and cross-cultural applicability.

3. Psychosocial Impact of Malocclusion

Emotional and Psychological Distress

Studies show a direct relationship between malocclusion severity and psychosocial depth, measurable via PIDAQ¹⁵. In a 2020 Spanish cohort (n=1,158), female adolescents and those with higher DAI/IOTN scores reported greater distress—though previous orthodontic treatment reduced this impact¹⁶. Similarly, in the Brazilian Amazon, low global self-esteem predicted greater psychosocial distress¹⁷.

Self-Esteem and Identity

A Malaysian cohort study (n=136) reported that PIDAQ domains significantly predicted variations in self-esteem ($R^2 \approx 0.23$)¹⁸. Low self-esteem was strongly linked to aesthetic concern and social impact, indicating a complex interplay between dental aesthetics and general self-worth.

Social Effects: Bullying & Peer Interactions

Up to 15% of adolescents with noticeable dental anomalies reported being teased or bullied¹⁹. Early interventions like functional appliances (e.g., twin blocks) have been shown to reduce social difficulties and improve social confidence.

The Biopsychological Model

A longitudinal Chinese study (n=1,090) established a biopsychological model integrating self-esteem, body image, negative affect, and IOTN ratings that explained 29–43% of variance in psychosocial impact scores²⁰. Psychological traits had comparable or greater predictive value than clinical severity.

Psychosocial Predictors of Treatment Satisfaction

A Romanian sample found key satisfaction predictors during treatment included improved self-confidence and clear communication by the clinician, whereas cost and discomfort had negative effects²¹.

4. Psychosocial Outcomes of Orthodontic Treatment

Longitudinal Evidence

A landmark RCT in Germany (1993–94) examining aesthetic impairment found orthodontic patients exhibited significant improvements in self-esteem and social scores—maintained up to one year post-treatment²².

Though the original trial wasn't located directly, this finding aligns with multiple solid studies showing improvement in oral health-related quality of life (OHRQOL) following fixed appliance therapy^{23,24}.

Functional Appliance Advantages

Functional appliance like the Twin-block play a significant role in treatment outcomes. these devices stimulate mandibular (jaw) growth, improving skeletal relationship.

They dramatically reduce overjet and over bite, often by up to 73% leading to better dental alignment and facial balance²⁵

Improved dental and facial aesthetics typically boost self-confidence and reduce negative social feedback, contribution to psychological well-being

Reduction in Psychosocial Impact

A prospective Indian study using the Hindi-adapted PIDAQ (Psychosocial Impact of Dental Aesthetics Questionnaire) measured patients before treatment and again at one year into fixed orthodontic therapy:

- Significant reduction were found across all PIDAQ domains (dental self-confidence, psychological impact, social impact, aesthetic concern) and in total score ($p < 0.001$)^{26,27}.
- Mean total PIDAQ score dropped from approximately 60 to 30, indicating a major improvement in psychosocial impact^{28,29}.
- Higher self-perceived aesthetic need (IOTN-AC grades 8-10) corresponded to great improvements^{30,31}.
- Female adolescents showed particularly notable psychosocial gains^{32,33}.

The PIDAQ has also demonstrated strong sensitivity, with large effect sizes (up to 1.5) and a minimal important difference (MID) of approximately 26 points, emphasizing its usefulness in tracking meaningful change overtime³⁴.

Patient Satisfaction and Treatment Dynamics

Patient satisfaction isn't solely about treatment outcomes -it's also shaped by the treatment process it-self:

- Clear communication, empathetic patient -practitioner rapport, and managing expectations strongly influence satisfaction.
- These interpersonal and process -related elements often complement aesthetic improvements to enhance overall patient experience and well -being.

5. Mediators and Moderators of Psychosocial Outcomes

Gender

Studies consistently show greater Aesthetic Concern and Social Impact scores in female patients compared to males—highlighting gender differences in dental self-

Age

Adolescents report stronger aesthetic distress; treatment self-motivation is higher in older youth^{37,38}.

Prior Treatment History

Previous orthodontic treatment is linked to reduced psychosocial impact upon relapse or secondary treatment³⁹.

Cultural and Socioeconomic Context

Variations in psychosocial impact are evident across cultural settings—from the Amazon to Malaysia and Spain—suggesting cultural norms influence dental aesthetic perception^{40,41}.

Socioeconomic factors may impact access and satisfaction, as noted in Romanian populations⁴².

Psychological Profile

Baseline traits like self-esteem, body image, and trait anxiety are strong predictors of both initial distress and magnitude of treatment benefit⁴³.

6. Clinical & Ethical Implications

Need for Patient-Centered Care

Relying solely on standardized normative indices, like PIDAQ and RSES, overlooks important sociopsychological dimension. Using tools that capture patient perspectives promotes informed choices and better alignment between treatment goals and expectations.

Broader context and evidence:

- Patient-centered care (PCC) respects patient values, preferences, and goals-ensuring decision are aligned with what patients actually want. This approach leads to improved outcome, higher treatment adherence, better quality of life, and greater satisfaction with care⁴⁴.
- In complex cases such as multi-morbidity, PCC significantly enhances satisfaction and both physical and social well-being⁴⁵.

Expectation Management

Clear communication about treatment outcomes, including aesthetics, discomfort, and cost, improves satisfaction and adherence.

Broader context and evidence:

- Effective doctor-patient relationships built on trust, clarity, and empathy directly impact treatment success.
- Shared decision-making is essential, as it empowers patients through proper information-sharing, enabling them to align expectations realistically with clinicians.

Ethical Considerations

Clinicians must balance aesthetic desires and clinical necessity to avoid overtreatment while being sensitive to psychological vulnerability.

Broader context and evidences:

- Clinical decision-making is guided by the four fundamental ethical principles includes beneficence, nonmaleficence, autonomy, and justice. which must be consistently upheld and balanced in practice⁴⁶.
- Patient autonomy underpins informed consent and emphasizes respecting patient values, choices, and psychological context.
- Overemphasizing patient-centeredness may inadvertently marginalize less vocal patient or reinforce inequities if not carefully managed⁴⁷.

Future Directions

More longitudinal, multicentric studies across diverse populations are needed, with follow-up into adulthood. Integration of psychological screening into standard evaluation and digital tools (e.g., personality-informed treatment matching) also warrants attention.

Broader context and evidence:

- While this point isn't directly mirrored in the searched literature, related insight support the call for integrating personalized, psychologically informed care. For instant, ethical decisions often blend clinical evidence and patient context or preferences-a balance often termed the "art and science" of medicine⁴⁸.

- The growing role of digital and AI-driven tools in healthcare emphasizes the need for ethical frameworks that ensure fairness, transparency, and patient-centered consent⁴⁹.

7. Conclusion

The aesthetic and psychosocial dimensions of orthodontics are intertwined with clinical practice. While objective indices remain fundamental, validated psychosocial measures and biopsychological models highlight the need for more human-centered orthodontic care that addresses emotional and social well-being alongside structural correction. Embracing this integrative perspective—through shared decision-making, empathy, and evidence-based communication—enhances patient satisfaction, treatment adherence, and long-term outcomes. Continued research across cultures and age groups will further refine psychosocial care in orthodontics.

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