

Ethical Considerations and Marketing Practices in Cosmetic Dentistry: A Systematic Review of Overtreatment and Patient-Centered Care

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Abstract

The growing cultural obsession with physical attractiveness, fueled largely by social media, has triggered a dramatic increase in patient demand for cosmetic dental treatments. This study seeks to examine the ethical implications of marketing strategies and the issue of overtreatment in aesthetic dentistry, with particular emphasis on their impact on patient well-being and the maintenance of professional standards. A systematic review of the literature was performed using four databases, initially identifying 76 articles. Following the application of predefined inclusion and exclusion criteria, 12 studies were deemed eligible for detailed analysis. The review concentrated on ethical issues, marketing strategies, and instances of overtreatment in cosmetic dentistry, with a narrative synthesis approach used to extract and summarize the relevant findings. The findings suggest that social media significantly shapes patient expectations, often emphasizing cosmetic results over medical needs. This trend poses ethical challenges related to informed consent and patient autonomy. The commercialization of dental services, driven by aggressive marketing, has led to a rise in overtreatment, with unnecessary procedures carried out to meet profit motives and idealized beauty standards. The review also points to a shortage of strong ethical guidelines regulating marketing in aesthetic dentistry, which further intensifies these concerns. The study emphasizes the critical need for well-defined ethical frameworks to help dental professionals balance patient well-being with commercial objectives. Suggested measures include incorporating ethics training into dental education, establishing detailed ethical guidelines, and promoting transparent communication between practitioners and patients. These steps are vital for supporting informed decision-making and ensuring that patient care remains the central focus in aesthetic dentistry.

Keywords: Ethical considerations, Marketing practices, Cosmetic dentistry, Patient-Centered Care

Introduction

The quest for physical attractiveness has become a defining feature of contemporary society, propelling aesthetic dentistry into a prominent position within modern dental practice. This shift is largely fueled by heightened cultural focus on appearance and the dominant role of social media [1]. Platforms like Instagram, Facebook, and TikTok have dramatically

reshaped cosmetic dentistry by enabling practitioners to display their results and connect directly with prospective patients on an unprecedented scale [2]. This digital transformation has not only increased public knowledge of aesthetic options but has also triggered a sharp rise in demand for procedures such as tooth whitening, veneers, and orthodontic treatments [2].

The convergence of aesthetic dentistry and marketing strategies gives rise to substantial ethical challenges. Although social media can effectively raise awareness of oral health and encourage preventive measures, it also opens the door to deceptive advertising and the exploitation of patients' desires for cosmetic improvement [3]. As clinicians strive to promote their services while safeguarding patient well-being, the danger of overtreatment emerges as a major issue.

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Overtreatment—defined as the performance of clinically unnecessary procedures—may stem from commercial incentives or patient expectations molded by idealized images circulated on social media [2].

Additionally, the marketing of cosmetic dental procedures often prioritizes visual results over clinical necessity, which risks turning dental care into a commodity [2, 4]. This development prompts serious questions about dentists' duties to uphold patient autonomy and ensure genuine informed consent amid powerful societal pressures that drive individuals toward aesthetic enhancements [4].

The ethical complexities surrounding marketing in aesthetic dentistry are profound. By emphasizing appearance over health benefits, promotional efforts can contribute to the commodification of care [2, 4]. Such practices challenge practitioners to safeguard patient autonomy and informed decision-making while acknowledging the external forces that motivate patients to pursue cosmetic changes [4].

The impact of social media on aesthetic dentistry is especially significant. These channels offer dentists a potent means of advertising their expertise and showcasing outcomes [5]. Nevertheless, this online environment poses risks to professional integrity and patient welfare when commercial goals overshadow ethical standards. Striking a balance between legitimate practice promotion and avoiding misleading or exaggerated claims demands vigilance and clear ethical direction.

The possibility of overtreatment represents a critical ethical dilemma in aesthetic dentistry that requires careful examination. With the escalating popularity of cosmetic procedures, the likelihood of recommending interventions that offer little or no clinical benefit grows accordingly. This concern is heightened because many aesthetic treatments are elective rather than medically essential, blurring the boundary between healthcare and enhancement services. Dentists must carefully manage their dual roles as health professionals and business owners [6].

Patient autonomy and truly informed consent remain cornerstone principles in ethical aesthetic dentistry and must take precedence. The difficulty lies in ensuring patients receive comprehensive, unbiased information about risks, benefits, and alternatives—particularly for procedures driven primarily by appearance rather than health. Practitioners have a responsibility to facilitate

decisions that are free from coercion or undue influence [4].

This systematic review seeks to investigate the ethical aspects of marketing practices in aesthetic dentistry, with particular attention to the issue of overtreatment in cosmetic procedures. By synthesizing literature published between 2011 and December 2024, the review illuminates the tensions dental professionals face in reconciling competitive market pressures with their ethical commitments to patients. This timeframe reflects a period of rapid evolution in both aesthetic dentistry techniques and related ethical concerns, heavily shaped by the explosion of social media and shifting patient expectations. Recent research reveals a marked increase in demand for cosmetic treatments, simultaneously raising alarms about potential biological and psychological risks [7]. Ultimately, this work aims to enrich the continuing discussion on ethics in aesthetic dentistry and offer practical guidance for practitioners navigating this dynamic and challenging domain [4].

As aesthetic dentistry gains ever-greater prominence, a rigorous evaluation of marketing ethics and the risks of overtreatment is essential. This review intends to lay a solid groundwork for understanding these interactions and fostering a more ethically sound approach to cosmetic dental practice.

Materials and Methods

We performed a systematic review of the literature by searching four key databases: PubMed, Web of Science, Scopus, and Google Scholar. Our search strategy incorporated terms such as “aesthetics,” “beauty,” “cosmetic dentistry,” “ethics,” “bioethics,” “professional ethics,” “marketing,” “advertising,” “overtreatment,” “unnecessary procedures,” “dentistry,” and “dental care.” Studies employing any research approach—quantitative, qualitative, mixed methods, or theoretical—were eligible for inclusion.

To maximize the scope of relevant studies, we refined our search by combining keywords with Boolean operators (AND, OR) and exploring variations and synonyms of key terms. We focused on publications from 2011 through December 2024, a period marked by significant shifts in aesthetic dentistry and ethical concerns, particularly due to the influence of social media on patient expectations and decision-making. The studies identified included a range of methodologies, such as surveys, interviews, and theoretical discussions. The

searches were conducted on 28 December 2024, and the complete database search strings are provided as a supplemental file to ensure transparency and reproducibility.

While our review prioritized peer-reviewed articles to ensure methodological quality, we acknowledge that excluding grey literature, books, and conference materials may limit the breadth of our findings. Grey literature can offer unique perspectives, practical case studies, and insights into emerging trends not yet captured in formal publications. Similarly, conference proceedings often present cutting-edge research, but their brief format can limit methodological detail, making it difficult to assess research quality accurately. To partially address this limitation, one dissertation was included, providing valuable insight into the role of social media in shaping aesthetic standards in dentistry. Nonetheless, our review may not fully capture all practical and ethical considerations outside traditional academic literature. Future studies could benefit from incorporating such sources to develop a more comprehensive understanding of ethical issues and overtreatment in cosmetic dentistry. Only English-language publications were considered. Following a detailed screening process, 13 out of an initial 76 identified articles met the inclusion criteria for this review.

Search strategy and boolean operators

The search approach was constructed by combining Medical Subject Headings (MeSH) descriptors with free-text keywords, linked through Boolean operators (AND, OR). The core search concepts were organized into four distinct clusters:

- Terms related to appearance and enhancement: “aesthetics,” “cosmetic dentistry,” “beauty”
- Terms related to morality and professional conduct: “ethics,” “bioethics,” “dental ethics,” “professional ethics”
- Terms related to promotion and treatment concerns: “marketing,” “advertising,” “social media,” “overtreatment,” “unnecessary treatment,” “excessive procedures”
- Terms related to the clinical field: “dentistry,” “dental practice,” “oral health care”

Database-specific search strings

Database Search Results

- PubMed: A combination of MeSH terms and title/abstract keywords retrieved 28 records.
- Web of Science: Topic field search (TS) produced 5 records.
- Scopus: Title–abstract–keyword search generated 26 records.
- Google Scholar: A supplementary hand-search uncovered 17 additional relevant publications.

Studies were included if they were peer-reviewed, published in English, and explicitly examined ethical issues in aesthetic/cosmetic dentistry, marketing/advertising practices, overtreatment, or the influence of social media in this context. Excluded items comprised non-English publications, editorials or commentaries lacking original data or analysis, and articles unrelated to ethical concerns in dentistry.

The review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [8]. Initial database searches identified 76 records. After removal of duplicates [9], 57 unique articles remained. Title and abstract screening eliminated records that did not address ethical dilemmas, were outside the scope of dentistry, or failed to discuss marketing or overtreatment, resulting in the exclusion of 41 articles.

Full-text retrieval was attempted for the remaining 16 papers. Two articles could not be obtained despite exhaustive efforts (institutional access, journal requests, and direct author contact) and were therefore removed, potentially introducing minor gaps in coverage. This left 14 full-text articles for in-depth assessment. Upon detailed review by the lead author, an additional two papers were excluded for not meeting the prespecified criteria (**Figure 1**).

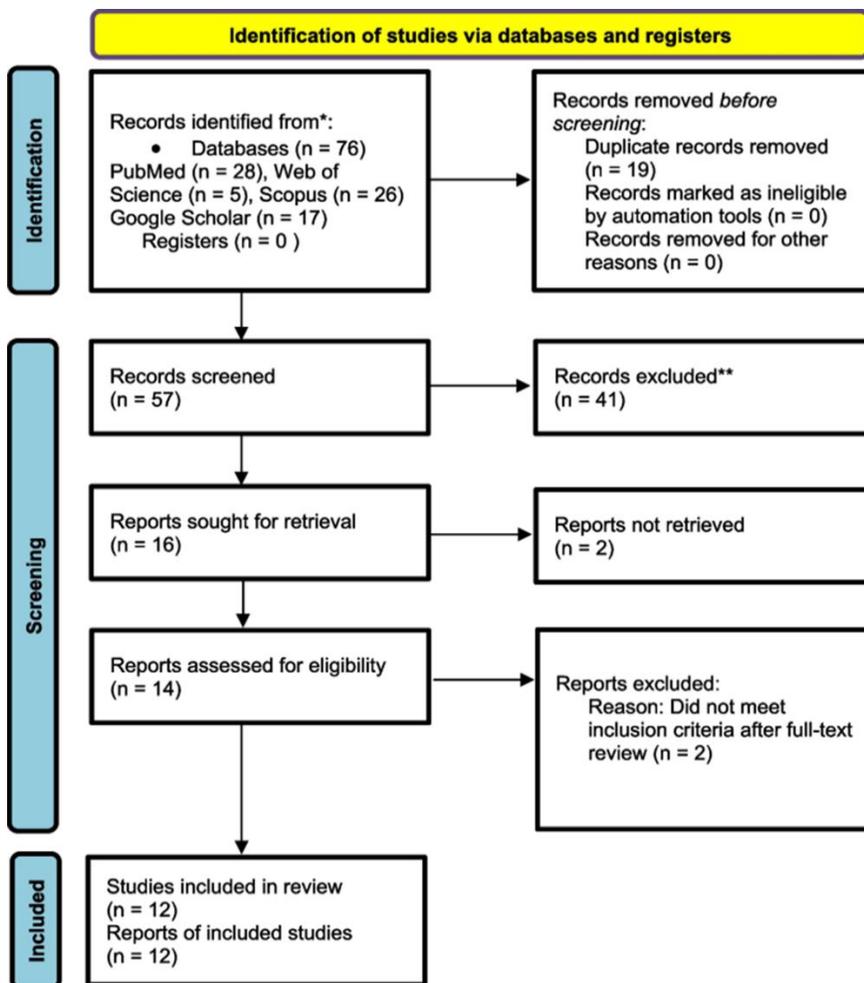


Figure 1. Preferred Reporting Item for Systematic Reviews and Meta-Analyses (PRISMA) flowchart

Data analysis description

The subsequent phase of this research focused on examining the 12 selected articles. A narrative synthesis approach was employed to analyze the data [10]. From each publication, we gathered key details such as the year and country of study, the research design, and the particular aspect of aesthetic dentistry addressed (for

instance, marketing strategies or excessive treatment). We also identified ethical concerns linked to marketing or overtreatment, factors that could intensify these ethical challenges, proposed strategies to mitigate such issues, and any positive ethical practices related to marketing in aesthetic dentistry (Table 1).

Table 1. Data extraction from retrieved papers

Study/Source	Authors	Year	Study Type	Participants	Objective	Key Findings	Ethical Considerations	Marketing Practices	Overtreatment Concerns	Impact of Social Media on Aesthetic Dentistry
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<p>Patient perspectives on social media influence in aesthetic dental choices</p> <p><i>Ahmad et al.</i></p> <p>2023</p> <p>Cross-sectional survey</p> <p>500 patients</p> <p>Evaluate how social media shapes patients' decisions about cosmetic dental work</p> <p>58.3% of patients trust dental content on social media; teeth whitening was the most sought-after procedure</p> <p>Exposure to idealized images promotes unattainable beauty standards</p> <p>Dental clinics' social media accounts heavily influence treatment-seeking behavior</p> <p>Surge in cosmetic requests can result in clinically unnecessary interventions [11]</p> <p>Primary information source and decision influencer</p>	<p>Ethical decision-making framework for treatment planning in aesthetic dentistry</p> <p><i>Kovács</i></p> <p>2023</p> <p>Theoretical paper</p> <p>N/A</p> <p>Discuss ethical approaches to planning dental treatments, especially aesthetic ones</p> <p>Patient autonomy and fully informed consent are central; tension often exists between aesthetic desires and oral health needs</p> <p>Prioritizing appearance over function can create ethical conflicts</p> <p>Marketing tends to emphasize cosmetic results, sometimes at the expense of health-focused messaging</p> <p>Overtreatment frequently linked to commercial interests and socially influenced patient demands [4]</p> <p>Indirectly exacerbates unrealistic expectations</p>	<p>Influence of social media on demand for cosmetic dental procedures</p> <p><i>Abbasi et al.</i></p> <p>2022</p> <p>Cross-sectional survey</p> <p>461 dentists</p> <p>Examine how social media affects patient demand for cosmetic dentistry</p> <p>90.7% of dentists reported a rise in requests for aesthetic treatments due to social media; most common procedures: teeth whitening (54.7%) and veneers (11.9%)</p> <p>Social media can create unrealistic patient expectations and mislead about treatment outcomes</p> <p>Heavy reliance on before-and-after images; platforms used for both advertising and patient education</p> <p>Heightened risk of unnecessary treatments driven by trends and online influence [2]</p> <p>Major driver of increased demand for aesthetic procedures</p>
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<p>The rise of uniform beauty standards in dentistry driven by social media</p> <p>Nayaz & Pieper</p> <p>2024</p> <p>Qualitative interviews</p> <p>4 clinicians (2 GDPs, 2 orthodontists)</p> <p>Explore how social media has reshaped dental beauty ideals</p> <p>Social media has standardized the “perfect smile”; clinicians feel pressure to deliver similar results</p> <p>Promoting unattainable or homogenized aesthetics raises ethical questions</p> <p>Active use of platforms for practice promotion and patient acquisition</p> <p>Treatment decisions increasingly influenced by online beauty trends [14]</p> <p>Primary force behind homogenized aesthetic demands</p>	<p>Freire <i>et al.</i></p> <p>2024</p> <p>Cross-sectional survey</p> <p>504 university students</p> <p>Determine the extent to which social media affects students’ decisions about aesthetic dentistry</p> <p>37% of students said social media directly influenced their decision to seek cosmetic treatment</p> <p>Promoting idealized smiles can create ethical challenges for practitioners</p> <p>Content from dentists and clinics is the most persuasive type of post</p> <p>Many treatments sought may not be clinically justified [13]</p> <p>Significant influence on treatment-seeking behavior</p>	<p>Mannaa</p> <p>2023</p> <p>Cross-sectional survey</p> <p>200 dental students</p> <p>Assess dental students’ understanding and views on esthetic dentistry</p> <p>Knowledge and positive attitudes toward aesthetics increase with academic year; strong awareness of current beauty standards</p> <p>Aesthetic-focused education can shape future treatment recommendations</p> <p>Universities indirectly influence how future dentists will market services</p> <p>Risk that students may later prioritize trendy treatments over necessity [12]</p> <p>Limited direct discussion</p>	<p>Holden <i>et al.</i></p> <p>2020</p> <p>Qualitative interviews</p> <p>20 dentists</p> <p>Investigate experiences and perceptions of overtreatment in private practice</p> <p>Dentists feel commercial pressure to recommend expensive treatments, sometimes unnecessarily</p> <p>Maintaining professionalism amid financial incentives is challenging</p> <p>Marketing often highlights lucrative, high-value procedures</p> <p>Overtreatment is common and difficult to quantify in daily practice [6]</p> <p>Not directly addressed</p>	<p>Overtreatment as an ethical issue in Australian private dental practice</p>
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<p>Most pressing ethical issues in Indian dentistry: Dentists' views</p> <p>Vanishree M. Kemparaj <i>et al.</i></p> <p>2018</p> <p>Qualitative study</p> <p>20 dental professionals</p> <p>Identify and prioritize ethical challenges faced by Indian dentists</p> <p>Top issues: poor sterilization, lack of ethics knowledge, and overtreatment</p> <p>Urgent need for continuing ethics education and awareness programs</p> <p>Aggressive advertising contributes to ethical conflicts</p> <p>Overtreatment ranked among the most serious concerns, often financially driven [18]</p> <p>Indirectly through patient expectations</p>	<p>Annabelle Tenenbaum <i>et al.</i></p> <p>2020</p> <p>Interventional study</p> <p>299 dental students</p> <p>Measure changes after introducing a dedicated medical ethics course</p> <p>Significant gains in ethical knowledge and awareness of legal responsibilities</p> <p>Ethics education is essential to produce professionally responsible graduates</p> <p>Not directly studied</p> <p>Better ethical training may reduce future overtreatment tendencies [17]</p> <p>Not addressed</p>	<p>B. Sabarinath, B. Sivapathasundharam</p> <p>2011</p> <p>Survey</p> <p>1128 dental clinics</p> <p>Evaluate adherence to ethical norms in Indian dental practices</p> <p>Widespread issues with misleading advertisements, overstated qualifications, and informed-consent deficits</p> <p>Need for stricter enforcement of ethical advertising and consent procedures</p> <p>Frequent use of exaggerated claims in marketing materials</p> <p>Misleading marketing contributes to patient pressure for unnecessary treatment [16]</p> <p>Not addressed</p>	<p>Dentists' ethical attitudes toward overtreatment: A Swiss vignette study</p> <p>Kazemian <i>et al.</i></p> <p>2015</p> <p>Vignette-based survey</p> <p>732 dentists</p> <p>Measure Swiss dentists' ethical sensitivity to overtreatment scenarios</p> <p>Vast majority view overtreatment as ethically wrong; many suspect it occurs frequently among colleagues</p> <p>Calls for stronger professional guidelines to combat overtreatment</p> <p>Not the main focus of the study</p> <p>Overtreatment seen as a serious and prevalent ethical problem [15]</p> <p>Not addressed</p>
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Expert perspectives on ethical challenges in dental practice	Vanishree M. Kemparaj <i>et al.</i>	2016	Qualitative study	15 bioethicists	Map major ethical problem areas in dentistry according to experts	18 categories identified, including overtreatment, conflict of interest, and commercialization	Strong call for formal ethical standards and ongoing training	Commercial marketing strategies exacerbate many ethical dilemmas	Overtreatment highlighted as a major issue linked to profit motives and marketing [9]	Limited mention
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Reviewer contributions

Alongside the listed authors, two further reviewers, Mohammad Aziz Rasouli and Yousef Moradi played a key role in the systematic review. They participated in study screening, data extraction, and the evaluation of study quality. Their backgrounds in epidemiology, biostatistics, and health development offered important perspectives that strengthened the thoroughness and credibility of the review.

Quality assessment statement

To uphold the integrity of the review, we systematically evaluated the quality of all included studies using the Joanna Briggs Institute (JBI) Critical Appraisal Tools [19]. Assessment criteria were adapted to each study’s

design, emphasizing methodological rigor, relevance to the research objectives, and the reliability of reported findings. Multiple reviewers independently conducted these evaluations, and any differences in judgments were reconciled through discussion to reach consensus, reducing subjective bias and ensuring consistency. This comprehensive appraisal highlighted the strengths and limitations of each study, including sample size considerations, potential biases, and ethical factors (Table 2). By contextualizing results according to study quality, we were able to produce a more dependable synthesis and draw well-supported conclusions regarding the role of social media in aesthetic dentistry.

Table 2. Quality assessment of included studies

Study/Source	Authors	Year	Study Type	Quality Assessment Summary	Impact of Social Media on Aesthetic Dentistry
Influence of social media on demand for cosmetic dental procedures	Abbasi <i>et al.</i>	2022	Cross-sectional survey	Strengths: Substantial sample (461 dentists); focused research question; clear evidence of social media influence. Weaknesses: Relies on self-reported data (risk of bias); absence of a comparison group	Strong driver of increased patient requests for aesthetic treatments
Ethical decision-making in aesthetic dental treatment planning	Kovács	2023	Theoretical paper	Strengths: Offers a solid conceptual framework for ethical treatment choices. Weaknesses: No original data; purely theoretical with no empirical validation	Indirectly linked through unrealistic patient expectations fueled by online content
Patient trust and influence of social media on aesthetic dental decisions	Ahmad <i>et al.</i>	2023	Cross-sectional survey	Strengths: Large patient sample (500); directly measures social media credibility. Weaknesses: Self-reported responses; no long-term follow-up to assess actual behavior	Major influence on patient decision-making and treatment-seeking
Overtreatment as an ethical challenge in Australian private practice	Holden <i>et al.</i>	2020	Qualitative study	Strengths: Rich, in-depth interviews with 20 practitioners; reveals real-world ethical tensions. Weaknesses: Small sample limits generalizability	Not directly examined

Dental students' knowledge and perceptions of cosmetic dentistry	Mannaa	2023	Cross-sectional survey	Strengths: Provides insight into future practitioners' attitudes. Weaknesses: Conducted at a single institution; possible self-selection bias	Minimal direct discussion
Effect of social media on university students' choices for cosmetic dental procedures	Freire <i>et al.</i>	2024	Cross-sectional survey	Strengths: Large sample (504 students); clear evidence of influence. Weaknesses: Cross-sectional design prevents establishing causality; self-report bias possible	Significant role in shaping treatment decisions among young adults
The homogenization of dental beauty standards through social media	Nayaz & Pieper	2024	Qualitative interviews	Strengths: Explores broader cultural impact; clinician perspectives. Weaknesses: Very small and unspecified sample; findings may reflect individual opinions rather than wider trends	Primary force creating uniform, often unrealistic aesthetic demands
Swiss dentists' ethical sensitivity to overtreatment scenarios	Kazemian <i>et al.</i>	2015	Vignette-based survey	Strengths: Large sample (732 dentists); structured ethical scenarios. Weaknesses: Hypothetical vignettes may not fully reflect real practice; social desirability bias possible	Not addressed
Adherence to ethical standards in Indian dental clinics	B. Sabarinath, B. Sivapathas undharam	2011	Cross-sectional survey	Strengths: Large-scale assessment (1,128 clinics); quantitative evidence of ethical shortcomings in daily practice. Weaknesses: Regional focus (Chennai only); data now relatively dated	Not examined
Impact of a dedicated ethics curriculum on dental students	Annabelle Tenenbaum <i>et al.</i>	2020	Interventional (pre/post) study	Strengths: Robust pre- and post-intervention design; objective measurement of knowledge and attitude gains. Weaknesses: Single-institution setting; long-term retention of learning not assessed	Not examined
Ranking of the most critical ethical issues in Indian dentistry	Vanishree M. Kemparaj <i>et al.</i>	2018	Qualitative study	Strengths: In-depth exploration and prioritization of real-world ethical challenges from practitioners' viewpoint. Weaknesses: Small sample (20 participants); findings context-specific to India	Indirectly relevant via patient demand influenced by media to India
Expert-identified ethical challenges in dental practice	Vanishree M. Kemparaj <i>et al.</i>	2016	Qualitative expert opinion study	Strengths: Comprehensive thematic analysis yielding 18 ethical categories; input from bioethics specialists. Weaknesses: Relies solely on expert opinion rather than frontline data	Limited direct connection

Trial registration

This systematic review has been recorded in the Research Registry and is identifiable by the registration number reviewregistry1935. The full registration information can be viewed directly on the Research Registry platform.

Results and Discussion

Methodological overview

This review systematically examined ethical concerns surrounding marketing practices and the risk of overtreatment in aesthetic dentistry. An initial search across four databases yielded 76 records, which, after removing duplicates, were narrowed to 57. Following a thorough screening process, 12 studies were ultimately included for analysis. The research methods varied widely, including theoretical papers, interventional

studies, qualitative interviews, and cross-sectional surveys.

The studies spanned the period from 2011 to 2024 and represented multiple countries, such as Hungary, Australia, Pakistan, Switzerland, Spain and India. Study populations ranged from 200 to 1,128 individuals and included a mix of dental practitioners, students, and patients, offering a broad perspective on ethical considerations in aesthetic dentistry.

Key findings

The review combined and examined the results with an emphasis on ethical issues, marketing strategies, and the occurrence of overtreatment in cosmetic dentistry. From the analysis of the selected studies, several prominent trends and patterns were identified:

Impact of social media on aesthetic dentistry

Most dental professionals, accounting for ninety point seven percent, observed a rise in requests for cosmetic procedures, largely driven by social media influence. The treatments most frequently sought were teeth whitening (fifty-four point seven percent), Hollywood smile makeovers (seventeen point one percent), and dental veneers (eleven point nine percent) [2]. Social media emerged as a key source of information for patients considering aesthetic dental treatments, shaping their expectations and increasing demand for cosmetic enhancements [11, 14].

Ethical considerations in aesthetic dentistry

Ethical challenges frequently emerge when cosmetic results are given precedence over patients' overall health. Kovács (2023) highlighted the crucial role of patient autonomy and the necessity of obtaining informed consent in such situations [4]. The commercialization of dental services, fueled by marketing that focuses on aesthetic outcomes, raises important concerns about dentists' obligations to prioritize patient well-being [4, 6]. Furthermore, Sivapathasundharam and Sabarinath (2011) pointed out ethical issues related to advertising practices, stressing the importance of securing informed consent in dental care [16].

Overtreatment concerns

Unnecessary dental procedures are often driven by financial incentives and the pressure to meet patients' expectations. Holden *et al.* (2020) reported that many dentists feel compelled to offer high-cost treatments,

which can contribute to overtreatment [6]. Similarly, Kazemian *et al.* (2015) noted that although dentists generally consider overtreatment ethically unacceptable, they remain wary of its occurrence among colleagues [15]. Kemparaj *et al.* (2018) also highlighted overtreatment as a major ethical concern in dentistry, largely influenced by commercial pressures [18].

Influence of social media on patient decision-making

Social media plays a major role in shaping patients' choices regarding cosmetic dental procedures. Freire *et al.* [13] reported that over one-third of university students, specifically thirty-seven percent, acknowledged that social media affected their decision to pursue aesthetic treatments. Similarly, Ahmad *et al.* (2023) found that fifty-eight point three percent of participants relied on social media for dental information, with many expressing interest in popular or trending procedures [11]. This impact is especially strong among younger individuals, who are more likely to base their decisions about cosmetic treatments on social media content [11].

Patient perspectives on aesthetic treatments

Patients' views on dental aesthetics are increasingly influenced by beauty standards presented on social media, resulting in elevated expectations for cosmetic procedures [14]. Nayaz and Pieper (2024) highlighted that patients frequently request particular treatments driven more by social media trends than by considerations of oral health [14].

Socioethical evaluation of cosmetic dentistry

Dental professionals often struggle to reconcile business interests with their duty to deliver care that prioritizes the patient's well-being [6, 14]. The growing commercialization of dentistry has fostered a more transactional dynamic between practitioners and patients, in which financial motives can sometimes take precedence over ethical responsibilities [6].

Marketing practices and ethical implications

Ethical issues arise when marketing in dentistry prioritizes cosmetic results over patients' health. The use of before-and-after images to promote services is common, with forty-eight point six percent of practitioners employing this technique to attract clients [2]. Such strategies continue to raise concerns about deceptive advertising and potentially manipulative content [4, 16].

Definition and measurement of overtreatment

Overtreatment in dentistry involves performing procedures that are unnecessary and do not align with the patient's best interests. The studies analyzed in this review approached this issue using multiple methods:

- **Surveys and Questionnaires:** Several studies gathered dentists' perspectives through surveys. For instance, Kazemian *et al.* (2015) found that many practitioners viewed overtreatment as an ethical concern and were worried about the prevalence of unnecessary interventions among colleagues [15].
- **Qualitative Interviews:** Some research used interviews to explore dentists' experiences, revealing that financial motivations often influenced clinical decisions and contributed to overtreatment [6, 18].
- **Case Reports:** A few studies presented detailed case examples where treatments exceeded what was clinically required, highlighting instances inconsistent with guidelines or patient needs [18].

Across the literature, commercial pressures consistently emerged as a central factor driving overtreatment. Notable influences included:

- **Economic Motivations:** According to Holden *et al.* (2020), many dentists felt pressured to recommend high-cost treatments for financial reasons, even when not clinically necessary, creating a conflict between business interests and patient welfare [6].
- **Marketing-Driven Practices:** Kemparaj *et al.* (2018) highlighted that marketing strategies often focus on profit rather than patient benefit, intensifying the ethical challenge of overtreatment [18].
- **Patient-Driven Demand:** Patients' expectations, shaped by social media portrayals of idealized smiles, can compel dentists to offer unnecessary procedures to satisfy these demands, further contributing to overtreatment [15].

Ethical concerns regarding overtreatment

Numerous dentists indicated experiencing pressure to perform treatments that were not clinically required, driven by economic rewards and the increasing commercialization of dentistry [6]. In their study, Kazemian *et al.* (2015) observed that while dentists recognized overtreatment as ethically unacceptable, they frequently perceived it as widespread within the profession [15]. Similarly, Kemparaj *et al.* (2016)

highlighted overtreatment as a major concern, largely fueled by aggressive marketing tactics and heightened patient demands, underscoring the critical need for strengthened ethical education among dental professionals [9, 15].

Positive impact of social media on patient education

In addition to the drawbacks previously discussed, the reviewed studies also identified several constructive ways social media contributes to patient education and understanding of cosmetic dental treatments:

- **Heightened public knowledge of oral health:** Numerous papers pointed out that social media functions as an influential platform for boosting general awareness of oral hygiene and preventive dentistry. Dental professionals actively leverage these channels to distribute reliable, educational posts emphasizing the importance of regular examinations and proactive oral care habits [5].
- **Fostering direct patient–clinician dialogue:** Social media creates opportunities for real-time, interactive communication between dentists and the public. This open exchange encourages questions, clarifies treatment pathways, and promotes shared decision-making, ultimately leading to better-informed patients [5].
- **Convenient access to procedure-related information:** Patients frequently reported that social media serves as an easily accessible resource for learning about various aesthetic treatment options. It enables individuals to explore procedures, weigh potential benefits against risks, and arrive at dental consultations with a stronger foundational knowledge [11].

Impact of ethics education

Incorporating ethics training into dental school programs has emerged as a promising strategy for tackling these challenges. According to Tenenbaum *et al.* [17], dental students demonstrated marked gains in their understanding of ethical principles and relevant legal obligations after completing a dedicated medical ethics module. These findings highlight the critical role of formal ethics education in preparing the next generation of dentists and suggest that such training could play a key part in reducing overtreatment linked to gaps in ethical awareness and decision-making skills.

Impact of social media on patient expectations

The review revealed a clear and recurring pattern: social media profoundly shapes patients' desires and expectations for cosmetic dental treatments. The main observations across the included studies were:

- **Surge in Patient Demand:** An overwhelming 90.7% of dentists observed a marked rise in requests for aesthetic treatments directly linked to social media exposure. The most frequently sought procedures were teeth whitening (54.7%) and veneers (11.9%) [2].
- **High Levels of Trust in Online Content:** Ahmad *et al.* (2023) found that 58.3% of patients considered dental information shared on social media reliable, often using it as a primary source when deciding on treatments [11].
- **Direct Impact on Treatment Choices:** Among university students surveyed by Freire *et al.* (2024), 37% explicitly stated that content seen on social media had driven their decision to pursue cosmetic dental procedures [13].
- **Creation of Unrealistic Standards:** Nayaz and Pieper (2024) emphasized that patients increasingly demand specific treatments modeled after filtered or edited images seen online, prioritizing appearance over clinical need and fostering expectations that are often unattainable or unnecessary [14].

Summary of key themes

The results of this systematic review highlight several key insights:

- **Impact of Social Media:** Online platforms play a major role in driving interest in cosmetic dental procedures, strongly shaping what patients expect from treatment.
- **Ethical Challenges:** Prioritizing aesthetic results over overall oral health presents significant ethical dilemmas for dental practitioners.
- **Risk of Overtreatment:** Commercial pressures and financial incentives increase the likelihood of unnecessary procedures, which is widely recognized as an ethical concern.
- **Patient Expectations:** Social media-driven ideals of beauty are influencing patients' demands, resulting in higher expectations for cosmetic interventions.
- **Marketing Approaches:** Promotional strategies often focus on visual outcomes rather than patient

well-being, raising concerns about informed consent and ethical responsibility.

- **International Perspectives:** Ethical issues in aesthetic dentistry are not confined to one region; the review shows that these challenges are global, with social media's role in marketing becoming increasingly prominent in recent years.

This systematic review sought to investigate the ethical aspects of marketing strategies and overtreatment within aesthetic dentistry, uncovering important findings regarding the interactions among social media influence, patient demands, and the ethical duties of dental professionals. The results from the analyzed studies underscore key issues deserving deeper exploration, including the role of social media, the ethical concerns surrounding marketing approaches, the problem of overtreatment, and the pressing need for comprehensive ethical standards in the field of aesthetic dentistry.

The review examines these ethical challenges using the framework of principlism, emphasizing the four core principles of biomedical ethics: autonomy, beneficence, non-maleficence, and justice. This structured approach offers a clear method for assessing the ethical dilemmas in aesthetic dentistry, especially in the context of balancing patients' wishes, clinicians' professional responsibilities, and commercial influences [20].

Influence of social media on aesthetic dentistry

Research shows that social media has a substantial effect on the field of aesthetic dentistry [2, 14]. Many dental professionals and patients recognize these platforms as key drivers of demand for cosmetic treatments. Instagram and Facebook, in particular, allow dentists to advertise their services and highlight their work [5]. While social media can be a useful tool for educating and engaging patients, it also carries the risk of spreading false information and promoting unattainable beauty ideals.

This dual nature of social media—as both an educational resource and a potential source of misleading content—creates challenges for dental practitioners. Dwivedi *et al.* (2021) [5] point out that social media can raise awareness about oral health and encourage preventive care, yet it can also be exploited for misleading advertising that preys on patients' desires for aesthetic improvements. These dynamics raise important ethical considerations regarding the responsibility of dentists to ensure patients are well-informed about the potential benefits and risks of treatments.

The impact of social media is particularly relevant to the principle of patient autonomy. Exposure to idealized images and trends can pressure individuals to pursue cosmetic procedures that may not align with their actual health needs [14]. Dentists therefore have a duty to provide clear, unbiased guidance to help patients make informed decisions that reflect their true interests rather than societal pressures.

Moreover, the focus on trending aesthetic outcomes can turn dental care into a commodified service, where appearance may take precedence over oral health. Kovács (2023) [4] stresses that safeguarding patient autonomy and obtaining genuine informed consent are essential in aesthetic dentistry. Dental practitioners must navigate the delicate balance between meeting patient expectations and maintaining their ethical obligation to prioritize the patient's overall health and well-being.

Ethical implications of marketing practices

The systematic review underscores the serious ethical challenges posed by marketing strategies in aesthetic dentistry, which frequently prioritize visual appeal over genuine oral health needs. Nayaz and Pieper (2024) [14] observed that intense societal expectations regarding beauty compel many dentists to adopt promotional approaches that place financial gain ahead of patient well-being. This transformation of dental care into a marketable commodity prompts urgent questions about practitioners' moral obligations when advertising their services [21].

Atiyeh *et al.* (2020) [3] noted that some practices employ misleading techniques to encourage patients to accept cosmetic procedures while downplaying or omitting important information about risks and benefits. Such conduct erodes patient autonomy and damages the professional credibility of dentistry as a whole. Similarly, Holden *et al.* (2020) [6] described the moral conflicts dentists experience when commercial pressures push them toward expensive interventions that lack clear clinical justification.

As early as 2011, Sabarinath and Sivapathasundharam [16] highlighted problems with advertising standards in dentistry, stressing the necessity of full transparency and robust informed consent processes. They argued that regulatory frameworks are essential to prevent patients from being deceived by overstated or inaccurate claims. These promotional practices directly threaten the principles of beneficence and non-maleficence. When financial motives overshadow patient welfare, clinicians

risk causing harm—either through unnecessary interventions or by withholding critical risk information. These behaviors fundamentally contradict core healthcare values and the longstanding commitment to “first, do no harm” [22]. The rapid expansion of aesthetic dentistry has shifted focus toward treatments that promise dramatic smile enhancements, often at the cost of holistic, health-centered care [3].

Particular concern is warranted for the psychological vulnerability of patients seeking aesthetic procedures [23]. Social media and targeted marketing frequently capitalize on insecurities tied to body image and social acceptance [24]. Many individuals pursue cosmetic dental work not solely for intrinsic satisfaction, but because they feel pressured by digitally amplified beauty ideals. This deliberate exploitation of emotional vulnerabilities for profit raises profound ethical issues [4, 24]. From the perspective of justice, such practices highlight inequities in healthcare, questioning whether patients—regardless of socioeconomic background or susceptibility to persuasive marketing—are treated fairly and protected from exploitation.

Overtreatment as an ethical concern

Overtreatment emerged as one of the most prominent and troubling ethical issues across the reviewed studies. Kazemian *et al.* (2015) [15] found that the vast majority of dentists consider overtreatment ethically unacceptable, yet many acknowledge its widespread occurrence in everyday practice. Holden *et al.* (2021) [6] define overtreatment clearly as the provision of procedures that are clinically unnecessary or not primarily in the patient's best interest, often resulting in substantial financial costs and avoidable health risks.

Research employed diverse methods—ranging from large-scale surveys of practitioners' attitudes to in-depth qualitative interviews—to gauge the scope of the problem. A consistent finding is that financial incentives and intense commercial pressures are the primary drivers of overtreatment. Numerous dentists openly admit feeling pushed to recommend expensive aesthetic interventions (such as veneers on healthy teeth or extensive whitening protocols) primarily to meet revenue targets or clinic expectations rather than genuine clinical need [6, 18].

Kemparaj *et al.* (2018) [18] ranked overtreatment among the leading ethical dilemmas currently facing the profession, attributing it to the interplay of market-driven practice models and heightened patient demand for

cosmetic enhancements. An earlier study by the same authors (2016) [9] further stressed the value of qualitative exploration in uncovering hidden conflicts of interest that fuel unnecessary treatment.

Promisingly, Tenenbaum *et al.* (2020) [17] demonstrated that structured ethics education can significantly strengthen dental students' understanding of professional boundaries and legal obligations. Their results suggest that targeted training in ethical decision-making may help future practitioners resist commercial pressures and reduce the likelihood of overtreatment.

The elective nature of most aesthetic procedures makes overtreatment especially problematic in this field. When treatments are not medically required, the threshold for justifying intervention becomes almost entirely ethical rather than clinical. This places extraordinary weight on the principles of beneficence (acting for the patient's genuine benefit) and non-maleficence (avoiding foreseeable harm). Performing irreversible procedures—such as aggressive enamel reduction for veneers—on healthy teeth solely to satisfy cosmetic desires or generate income directly violates “do no harm” and can expose patients to long-term complications including hypersensitivity, structural weakness, or future restorative needs [6, 25].

Al-Worafi (2023) [25] argues that the rapid commercialization of cosmetic dentistry has blurred traditional professional boundaries, forcing practitioners into a difficult balancing act: satisfying patients' often unrealistic expectations while remaining faithful to evidence-based, health-centered care. The studies collectively warn that when financial and social pressures dominate decision-making, patient welfare is inevitably compromised, leading to both immediate financial burdens and potential lifelong oral health consequences. In summary, overtreatment in aesthetic dentistry represents a clear collision between commercial interests and core ethical duties. Addressing it effectively will require stronger regulatory oversight, mandatory continuing ethics education, and cultural shifts within the profession that reassert clinical necessity and patient well-being as the primary guides for treatment planning.

Influence of social media on patient expectations

The results of this systematic review indicate a clear influence of social media on patient expectations within aesthetic dentistry. Across multiple studies, several consistent themes emerge:

- *Rising interest in cosmetic treatments:* Social media has significantly contributed to the growing popularity of aesthetic dental procedures. Dentists report an increase in patients requesting widely sought-after treatments such as teeth whitening and veneers [2, 11].
- *Reliance on online information:* Many patients place considerable trust in dental information found on social media, which strongly affects their treatment choices [11, 13]. This highlights the importance for dental professionals to provide accurate guidance and engage responsibly with patients on these platforms.
- *Influence of beauty ideals:* Exposure to idealized images and beauty standards online can create unrealistic expectations for patients. This trend raises ethical concerns regarding the commercialization of dental services and the risk of unnecessary treatments [14].
- *Educational opportunities:* On the positive side, social media can serve as an effective tool for patient education. Dentists can use these platforms to share information about oral hygiene, preventive care, and the importance of routine dental check-ups [5], helping patients make informed decisions and promoting better oral health outcomes.
- *Challenges for informed consent:* The prevalence of social media content can complicate the informed consent process. Patients may arrive at consultations with preconceived ideas shaped by curated online material, rather than a thorough understanding of their personal dental needs [4].

Need for ethical guidelines

This review highlights the pressing need for explicit ethical standards in aesthetic dentistry. Research consistently emphasizes the importance of creating clear frameworks to guide practitioners in areas such as patient consent, autonomy, and the ethical promotion of dental services [20, 26, 27]. Kovács (2023) [4] argues that such guidelines are essential for navigating the complex ethical landscape of cosmetic dental care while ensuring that patient interests remain central.

One critical approach to addressing these ethical challenges is the promotion of responsible marketing practices. Training programs and educational initiatives can play a pivotal role by reinforcing the principles of evidence-based care, informed consent, and respect for

patient autonomy [15, 28]. In the absence of structured ethical guidance, there is a risk that practitioners may act without sufficient accountability, potentially offering treatments or promotions that do not prioritize patients' well-being.

Ethical frameworks also serve to uphold fairness and support patients' rights to make informed decisions. Clear standards can help ensure that all patients are treated equitably and that their choices are respected. Professional bodies and regulatory authorities have a responsibility to develop and enforce these standards, particularly in light of the challenges posed by social media and the growing demand for elective aesthetic procedures. By doing so, patient welfare can remain the primary consideration in both treatment planning and marketing strategies.

Informed consent in aesthetic dentistry should extend far beyond a simple explanation of risks and benefits [29]. It requires comprehensive discussions about realistic results, alternative approaches, and the psychological effects of cosmetic interventions [30]. Dentists must also clarify that social media often presents highly curated or digitally enhanced outcomes, which may not be attainable for every patient. An effective consent process should carefully document patients' expectations and provide a clear understanding of the limitations and potential results of aesthetic treatments [6].

Concrete steps for regulatory bodies and professional organizations

To ensure ethical standards are effectively established and maintained, professional associations and regulatory authorities in dentistry can undertake a number of strategic initiatives:

- *Develop detailed ethical guidelines:* Organizations should design comprehensive frameworks that specifically address the complexities of aesthetic dentistry. These guidelines should cover areas such as obtaining informed consent, responsible advertising, and the ethical considerations associated with social media promotion.
- *Integrate ethics training into education:* Ethics instruction should be incorporated into dental school curricula and continuing professional development programs. Training should emphasize the particular ethical challenges in cosmetic dentistry, including the risks of unnecessary procedures and the importance of prioritizing patient welfare [17].
- *Provide practical tools and resources:* Professional bodies can create practical resources, such as toolkits, case studies, and best-practice guides, to assist dentists in resolving ethical dilemmas. These materials can offer structured decision-making frameworks to support informed and responsible clinical choices.
- *Establish reporting systems:* Regulatory authorities should implement mechanisms that allow unethical practices—such as overtreatment or misleading marketing—to be reported safely and confidentially. Such systems should protect both patients and practitioners who raise concerns from potential retaliation.
- *Encourage professional dialogue:* Facilitating workshops, conferences, or forums that bring together dental practitioners, ethicists, and regulators can promote discussion of ethical issues and the sharing of experiences. This collaborative approach helps build a professional community committed to high ethical standards in aesthetic dentistry.
- *Monitor compliance and assess impact:* Authorities should regularly review practices in aesthetic dentistry to ensure adherence to ethical standards and evaluate the effectiveness of implemented guidelines. Continuous monitoring can help identify areas for improvement and reinforce accountability among practitioners.

By implementing these strategies, professional organizations and regulatory bodies can support dentists in navigating the ethical complexities of cosmetic dentistry. Such measures not only safeguard patient welfare but also reinforce the credibility and integrity of the dental profession as a whole.

Implications for practice

The findings of this systematic review carry important implications for dental practitioners. First, it underscores the necessity for dentists to interact with patients on social media in a responsible and ethical manner. This involves providing accurate information about aesthetic treatments, clearly communicating potential risks, and helping patients form realistic expectations. Transparent and open communication can empower patients to make informed choices regarding their dental care.

Second, practitioners must remain alert to the risks of overtreatment and the ethical challenges posed by

commercial pressures. Maintaining a balance between clinical professionalism and business interests is essential, ensuring that treatment recommendations are driven by genuine clinical need rather than financial gain. Cultivating a practice culture that prioritizes ethical decision-making and patient welfare over profit is a key strategy in addressing these challenges.

Moeller and Quiñonez (2020) [31] note that economic incentives may sometimes influence dental practice, resulting in an emphasis on cosmetic procedures at the expense of essential care and potentially neglecting underserved populations. To counteract this, dental professionals should uphold patient autonomy and ensure that informed consent is central to every treatment decision, guaranteeing that care aligns with the patient's overall health and well-being [32].

Limitations and future research directions

This review is subject to certain limitations. The small number of studies that satisfied the inclusion criteria indicates that more research is needed to fully understand these issues. Additionally, the rapidly changing nature of social media platforms and marketing practices means that some of the findings may quickly become outdated. Future research should aim to gather long-term data to assess how social media influences patient behavior and ethical decision-making in aesthetic dentistry over time. Further studies should also evaluate the impact of educational interventions designed to enhance patients' knowledge of cosmetic dental procedures and their potential risks. By equipping patients with accurate, evidence-based information, these programs can help counteract the effects of social media and support informed, thoughtful decision-making. Moreover, research should examine the role of professional bodies and regulatory authorities in creating and enforcing ethical standards. Understanding how these organizations can guide practitioners in managing the ethical challenges of marketing, elective treatments, and overtreatment is crucial for promoting a more responsible and patient-centered approach to cosmetic dental care.

Conclusion

This systematic review highlights the pressing ethical issues in aesthetic dentistry, particularly those related to marketing strategies and the potential for unnecessary treatments. The evidence demonstrates that social media exerts a powerful influence on patient expectations, often

emphasizing cosmetic outcomes over clinical health considerations, which can compromise informed consent and patient autonomy.

The findings underscore the necessity of establishing clear ethical guidelines to address these challenges. Incorporating ethics training into dental education and implementing comprehensive standards for marketing practices are critical steps to ensure that patient welfare remains central to clinical decision-making.

Ultimately, this review calls on dental practitioners, regulatory authorities, and educational institutions to work collaboratively in tackling these ethical challenges. By fostering a patient-centered and ethically responsible approach to cosmetic dentistry, the profession can protect its integrity while meeting patients' legitimate desires for aesthetic enhancement.

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