

Conflict of interest and professional integrity in the relationship between dentists and dental product companies

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Abstract

Background: Conflicts of interest (COI) between dental professionals and industry manufacturers represent a persistent ethical challenge that undermines the credibility of research, editorial independence, and evidence-based clinical decision-making. Despite global recognition of these issues, the dental field continues to exhibit inadequate transparency and inconsistent implementation of disclosure policies, threatening the integrity of professional conduct and patient trust.

Objective: To comprehensively examine the prevalence, patterns, and consequences of COI in dentistry while evaluating current mitigation strategies and proposing evidence-based recommendations to enhance professional and research integrity.

Methods: The review was conducted in accordance with the PRISMA-ScR framework, encompassing seven peer-reviewed studies published between 2020 and 2024. Data were systematically extracted concerning COI prevalence, disclosure completeness, research outcome biases, and policy interventions. Methodological quality was appraised using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist to ensure rigor, transparency, and relevance to dental practice.

Results: Three principal dimensions of COI were identified. First, *editorial independence* was compromised in 62% of dental journals whose editors maintained undisclosed financial relationships with industry. Second, *research validity* was jeopardized, as industry-funded studies were 3.2 times more likely to report favorable outcomes compared to independently funded research. Third, *clinical decision-making* was influenced by commercial exposure, with 54% of practitioners modifying product preferences after attending industry-sponsored training programs. Notably, only 28% of journals possessed comprehensive disclosure systems.

Conclusion: The findings reveal systemic deficiencies in COI disclosure and governance across the dental profession. To uphold ethical integrity and safeguard public trust, the implementation of standardized disclosure registries, mandatory COI education, double-blind peer review for industry-funded studies, and patient-facing conflict declarations is imperative.

Keywords: Dental Ethics; Conflict of Interest; Industry Relations; Research Integrity; Disclosure Policies

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1. Introduction

The intersection between dental practice and corporate interests has become a growing ethical concern in contemporary healthcare. Over the past decade, the global dental market has expanded to \$32 billion annually, creating increasingly complex financial relationships between practitioners and manufacturers [1]. This scoping review addresses three fundamental questions that have emerged from recent literature: First, how prevalent are undisclosed conflicts of interest in dental research and publishing? Second, what measurable impact do these conflicts have on scientific validity and clinical decisions? Third, what solutions demonstrate promise for mitigating these issues?

Recent studies paint a concerning picture, audit of 47 dental journals found that nearly two-thirds of editors had financial ties to industry that were not properly disclosed [2]. Parallel research by Al-Hassiny et al. (2020) demonstrated that industry funding creates significant outcome biases, particularly in studies of high-profit devices like dental implants [3]. Perhaps most troubling are findings from clinical practice revealed that most dentists fail to discuss these conflicts with patients when recommending commercially promoted treatments [4].

The stakes of these issues are particularly high in dentistry for three reasons: (1) Unlike pharmaceuticals, most dental devices bypass rigorous FDA-equivalent testing; (2) Patients rarely question dental product recommendations; and (3) The field lacks standardized COI reporting requirements common in other medical specialties. This review synthesizes the latest evidence to map these challenges while highlighting innovative solutions from the 2020-2024 literature.

2. Methods

The data extraction process employed a three-phase search strategy consisting of database searches, manual journal screenings, and citation mining. In the first phase, PubMed, Scopus, and Embase were systematically queried using MeSH terms such as "dentistry AND conflict of interest," "industry relations," and "research integrity." The second phase involved manual screening of all issues published between 2020 and 2024 from major dental journals identified in Novelawaty's (2024) bibliometric analysis [5]. The final phase, citation mining, entailed a careful examination of the reference lists from the included studies to identify additional relevant publications that may not have appeared in the initial searches. This structured approach ensured that the data gathered were comprehensive, up to date, and relevant to the objectives of this review.

The inclusion criteria were carefully established to ensure that only studies meeting appropriate scientific and ethical standards were incorporated into the analysis. Eligible studies included original research providing empirical data on financial relationships within dental contexts, excluding editorials and commentaries. Studies were required to be published in English between January 2020 and March 2024 and to pass the quality assessment using the JBI Critical Appraisal Checklist. These parameters ensured that the included studies were methodologically sound, relevant to the topic of COI, and aligned with the research objectives of this review.

A standardized data extraction template was developed to capture essential study characteristics, including design, sample size, and timeframe. Specific attention was given to COI metrics such as prevalence rates and completeness of disclosure, as well as to impact measurements that examined outcome biases and clinical influences. Additionally, information regarding proposed solutions such as policy interventions and technological tools was systematically recorded. Data synthesis employed a convergent qualitative approach, allowing the integration of both quantitative and qualitative findings. The results were categorized into three predefined domains editorial, research, and clinical while accommodating the emergence of new themes related to ethical transparency and innovation in COI management.

Each study underwent a thorough quality assessment that evaluated methodological rigor, transparency, relevance, and novelty. Factors such as sampling methods, the presence of appropriate controls, the accuracy of data analysis, and the disclosure of funding sources were examined to determine each study's reliability. The review process involved dual independent screening by two authors, with any disagreements resolved through consensus discussions with a third reviewer. This rigorous evaluation process ensured that the findings reflected a balanced and scientifically robust representation of COI issues in dentistry. The methodological integrity of this process reinforces the credibility of the review and ensures that the synthesized evidence accurately reflects the current state of ethical practice in dental research and professional conduct.

3. Results

The study by Faggion represents the most comprehensive audit of conflict of interest (COI) disclosures among dental journal editors to date. Analyzing 1,893 editorial board members across 47 prominent dental journals, it was found that 62% had financial relationships with dental product companies that were not adequately disclosed. These relationships included consulting fees, research grants, and speaker honoraria. Only 28% of the journals had publicly accessible COI disclosure forms for their editorial teams. Furthermore, journals without strict COI policies published 40% more studies with positive industry-related outcomes than those with rigorous disclosure requirements, indicating a potential influence of undisclosed financial ties on publication decisions [2].

In addition, a systematic review conducted by Al-Hassiny examined 287 industry-funded dental studies published between 2015 and 2020. Their analysis revealed that industry-funded research was 3.2 times more likely to report positive outcomes compared to independently funded studies, especially in research on dental implants. Only 22% of these studies disclosed the specific amounts of funding received, while 45% failed to mention potential limitations arising from funding sources. Moreover, 68% of industry-funded randomized controlled trials exhibited methodological issues such as inadequate blinding or selective reporting, raising concerns about the validity of their findings [3].

Further, survey data from Khan and Ahmad involving 542 practicing dentists demonstrated that industry relationships significantly influence clinical behaviors. Over half (54%) of respondents reported changing their preferred materials or equipment after attending industry-sponsored training, mainly in implants and restorative materials. While 68% believed these trainings enhanced their skills, only 12% routinely discussed COIs with patients when recommending industry products. The study also identified a "loyalty cascade," where dentists attending more than three industry-sponsored events annually were 4.5 times more likely to exclusively use that company's products [4].

Finally, a bibliometric analysis by Melawati and Lawanda of 1,284 dental publications identified increasing attention to COI management. Since 2015, publications on COI transparency have increased by 300%. Blockchain-based disclosure systems emerged as promising solutions, demonstrating 92% accuracy in tracking industry payments during pilot testing. Journals using automated COI screening tools reduced disclosure violations by 50%, indicating technological innovations' potential to improve transparency [5].

4. Discussion

The findings across these studies reveal significant concerns about conflicts of interest affecting multiple facets of dentistry, from research integrity to clinical decision-making. The high prevalence of undisclosed financial ties among journal editors suggests that bias may influence what research gets published and how it is presented. The association between weak COI policies and the increased publication of positive industry outcomes highlights the potential for financial conflicts to shape the scientific literature, necessitating stricter disclosure policies and blinded review procedures to mitigate undue influence.

Biases in industry-funded research further compromise the credibility of the evidence base. The tendency for such studies to report more favorable outcomes, combined with incomplete funding disclosures and methodological flaws, complicates efforts to evaluate the true efficacy and safety of dental products. Strengthening transparency requirements, including detailed funding disclosures and statistical checks, can improve the reliability of published research.

In clinical practice, the influence of industry relationships appears substantial, with many practitioners modifying their treatment choices based on industry-sponsored education and events. The "loyalty cascade" phenomenon illustrates how industry interactions can foster product bias, potentially impacting patient care. There is an evident need for dental practices to implement standardized COI disclosures and discussion protocols during informed consent processes, ensuring ethical patient communication and decision-making.

Emerging solutions, such as blockchain-based disclosure systems and automated screening tools, show promising potential to address existing transparency challenges. The marked increase in research and technological innovations points toward a future where COI management becomes more robust and reliable. Integrating these technological tools with institutional policies, including COI competency training in dental education, could foster a culture of greater transparency and ethical awareness within the profession.

5. Conclusion

The evidence from these studies paints a concerning picture of systemic COI issues in dentistry, but also points to actionable solutions: First, mandatory disclosure registries (modelled after successful systems like the U.S. Open Payments program) could significantly improve transparency.

Second, the dental research community should adopt evidence-based safeguards like blinded peer review and outcome-statistical checks for industry-funded studies. Third, clinical practice would benefit from standardized patient disclosure forms and discussion protocols. Future research should focus on longitudinal studies of COI policy effectiveness and the development of AI-based disclosure verification systems. The findings collectively suggest that while financial relationships between dentists and industry are inevitable, their management must become more rigorous, transparent, and patient-centred.

Compliance with ethical standards

Disclosure of conflict of interest

There is no conflict of interest declared by authors in this study.

Statement of ethical approval

This article does not contain any experiment performed on animals/humans' subjects by any of the authors.

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