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Review Article

Iatrogenic mistakes in dentistry, when to disclose: a literature review

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ABSTRACT

Iatrogenic harm (injury from treatment) is a preventable healthcare issue. In dentistry, it arises from procedural mistakes, inexperience or communication failures, causing complications like faulty restorations or nerve damage. The oral environment and complex treatments increase risk. While not always malpractice, ethical and legal disclosure is crucial. Timely, transparent communication builds trust and reduces liability. Despite guidelines, disclosure barriers remain, necessitating further exploration of effective strategies. This literature review synthesizes studies on iatrogenic dental mistakes and their disclosure. A comprehensive search strategy was employed, utilizing databases such as PubMed, Web of Sciences and Google Scholar to identify relevant studies published from 1990 to 2024. Included studies focus on iatrogenic dental mistakes/adverse events and the ethical, legal and practical aspects of their disclosure, including recommendations and patient/practitioner perspectives. Iatrogenic mistakes in dentistry stem from inadequate anatomical knowledge, improper clinical techniques and systemic issues such as poor communication and insufficient training. Common complications include nerve damage, periodontal injury, root resorption and prosthodontic errors. Strict adherence to protocols, enhanced training and risk management are crucial for reducing errors. Error disclosure is influenced by ethical obligations, legal concerns and institutional culture. While transparency fosters trust, fear of litigation remains a major barrier. Effective disclosure requires structured frameworks, improved communication and institutional support to enhance patient-provider relationships and ensure accountability. Iatrogenic mistakes challenge all dental specialties, demanding effective prevention and disclosure strategies. Minimizing harm requires improved training, standardized protocols and supportive cultures. Crucially, overcoming disclosure barriers, like fear of litigation, necessitates clear communication, ethical emphasis and patient trust to foster transparency and improve patient safety.

Keywords: Dentistry, Disclosure, Errors, Iatrogenic, Legal aspects

INTRODUCTION

Iatrogenic mistakes

Iatrogenic harm (harm from treatment) is a common, often preventable and costly problem in healthcare, remaining frequent despite increased awareness.[1] It is defined as "harm, hurt, damage or impairment that results from the activities of a doctor".[2] While not all cases constitute malpractice, iatrogenic events are increasing, causing physical, psychological and legal problems. The frequency and extent of such damage depend on several factors, including the patient's clinical condition and the practitioner's skill and experience.[3] Iatrogenic healthcare issues (e.g., adverse drug reactions, errors, infections) can stem from negligence, inexperience or communication failures. Dentists, like other providers, can cause such harm, risking malpractice.[4] Dental iatrogenic injuries

result from unintentional or incorrect treatment (action or inaction). Any procedure carries risk, especially in the confined oral environment; supine positioning further increases collateral damage risk due to instrumentation near vulnerable tissues.[5] Iatrogenic dental issues include faulty restorations, damage to adjacent teeth, extraction injuries, jaw dislocation, root displacement, gum lacerations, prosthesis problems, pulp exposure and nerve damage from anesthesia.[6]

The importance of understanding etiology and treatment planning to minimize these factors were emphasized, urging clinicians to consider the consequences of unplanned treatment.[7] Analyzing error patterns allows for the identification and addressing of preventable mistakes. Patient safety programs are increasingly adopting practices from high-risk industries, viewing errors as learning opportunities.[8] Procedures endangering a patient's life, whether intentional or accidental, have legal repercussions. The complexity of dental treatments demands extensive knowledge and skill.[4] Healthcare complaints, often emotionally charged, subjective and complex, offer valuable insights for improving services. Analyzing these complaints helps pinpoint areas of dissatisfaction and safety lapses.[9]

Significance of disclosure

Patients deserve to know about care errors. Timely, complete disclosure is ethically and legally re-quired (RCDSO) due to fiduciary responsibility, breaches risk damages.[10] Despite unavoidable dental errors, prompt, honest disclosure is ethically and strategically crucial. This involves investigating the error, its impact and solutions; seeking expert advice; documenting the disclosure (including patient understanding); facilitating transitions; and maintaining other patient care. Honest, prompt action is patient-centered, prevents harm and reduces liability.[11] Dentists must disclose all adverse events (even minor ones) via acknowledgment, explanation, regret, harm reduction and prevention. Non-disclosure breaches fiduciary duty, risking penalties. Undisclosed "fixes" void consent. Post-event, prioritize patient well-being, communicate factually, express regret cautiously (Apology Act) and document everything, regardless of fault. Non-harmful errors warrant analysis. Proper disclosure benefits all, potentially preventing lawsuits.[12]

Patients deserve honest information about adverse events. This toolkit guides dentists in incident disclosure (acknowledgment, factual explanation, regret, harm reduction and prevention). Disclosure builds trust, enables consent and improves systems to prevent recurrence, potentially reducing complaints.[13]

Objectives

To identify and analyze the different types of iatrogenic mistakes that occur in dentistry. To examine the ethical and legal obligations of dentists regarding the disclosure of iatrogenic mistakes. To evaluate the effectiveness of various disclosure strategies in dentistry. To explore the challenges and barriers that prevent dentists from disclosing iatrogenic mistakes.

METHODS

To develop this literature review, a comprehensive search was conducted using databases such as PubMed, Scopus, Cochrane Library, and Google Scholar. Keywords used included: “iatrogenic injury” OR “dental errors” OR “adverse events” AND “dentistry” AND “disclosure” OR “informed consent” OR “legal aspects” AND “iatrogenic complications” AND “duty to disclose”. The search was limited to articles published between (2000) and (2024) (or before if they provide foundational knowledge for pre-existing standards or legal precedents related to disclosure). Articles were reviewed to understand the key factors influencing disclosure decisions, the impact of disclosure on patients and practitioners, and best practices for managing iatrogenic events in dentistry. Studies included are those focused on iatrogenic mistakes or adverse events in dental settings and articles addressing the ethical, legal, or practical aspects of disclosure, including recommendations for disclosure practices and patient/practitioner perspectives.

Iatrogenic mistakes

Moglia et al, studied the role of anatomical ignorance in iatrogenic morbidity, finding that inadequate knowledge led to surgical errors, nerve damage and vascular complications, increasing patient harm. The study highlighted insufficient training and misinterpretation of anatomy as key error factors, emphasizing the need for better anatomical education and clinical training to reduce complications and improve patient safety.[14]

Niazi et al, investigated iatrogenic damage to dental hard tissues. It was found that such damage is frequently caused by improper clinical techniques and instrumentation during dental procedures. In conclusion, it was emphasized that strict adherence to proper protocols and improved techniques are essential to minimize such harm.[15]

Moreover, Corte-Real et al, examined the risks and limitations in dental practice through a Portuguese perspective on medical-legal evaluation and professional liability. The study found that dental professionals often face significant legal risks due to errors or malpractice, especially in complex procedures. It concluded that better understanding of legal responsibilities, improved risk management practices and professional training are essential to mitigate such risks and prevent legal complications.[16]

Iatrogenic injuries, errors and patient safety within the NHS were explored by Sirrs et al, focusing on cultural

factors. Systemic issues like poor communication, inadequate training and lacking safety protocols were found to contribute to iatrogenic errors. A safety-oriented culture and robust error-reporting are crucial for harm prevention. Transparency, continuous education and patient-centered care are essential for improved healthcare safety.[17]

Verma et al, investigated the iatrogenic effects of orthodontic treatment, identifying common complications. It was found that excessive forces, improper biomechanics and poor oral hygiene during orthodontic treatment can cause root resorption, periodontal damage and enamel demineralization. Careful planning, patient education and monitoring are crucial to minimize these iatrogenic risks.[18]

Iatrogenic complications in orthodontics and associated challenge were examined by Feitosa et al. It was found that improper biomechanics, poor treatment planning and inadequate patient compliance contributed to issues such as root resorption, periodontal damage and occlusal disturbances. Careful diagnosis, technique and patient education minimize iatrogenic orthodontic risks. Adherence to protocols and professional development further reduce errors.[19]

Iatrogenic factors affecting the periodontium were reviewed by Prasad et al, reviewed, identifying improper restorations, orthodontic forces and surgical trauma as key contributors to periodontal damage. Overhanging restorations, subgingival margins and excessive occlusal forces were found to promote plaque accumulation and inflammation, leading to attachment loss. It was concluded that precise treatment planning and technical accuracy are essential to minimize iatrogenic harm and preserve periodontal health.[1]

Rajan et al provided an overview of iatrogenic damage to the periodontium caused by exodontic procedures. It was found that improper tooth extraction techniques can lead to harm of the alveolar bone and gingival tissues. In conclusion, it was emphasized that careful planning and refined surgical techniques are essential to minimize periodontal injuries during extraction.[20]

Kripal et al reviewed iatrogenic periodontal damage caused by laser treatment in dentistry. It was found that improper laser use can lead to thermal injury, delayed healing and periodontal tissue damage. The study emphasized the need for precise technique, proper training and adherence to safety protocols to minimize risks. It was concluded that careful application and clinician expertise are essential in preventing laser-induced iatrogenic complication.[7] The frequency of iatrogenic errors in root canal treatments by reviewing 1335 dental patient charts was evaluated by Haji-Hassani et al evaluated. It was found that a significant number of procedural errors occurred during treatment. In conclusion, it was emphasized that improved training and adherence to standardized protocols are essential to reduce such errors in endodontic practice.[21]

Hassan et al, investigated the prevalence of endodontic mishaps and their management in private and public dental institutes in Punjab, Pakistan. The study found a significant occurrence of mishaps, such as perforations and instrument fractures, with private institutions reporting slightly higher rates. The study concluded that proper training, stricter protocols and enhanced supervision are crucial to reduce mishaps and improve treatment outcomes in both private and public settings.[22]

Iatrogenic incidents in primary molar pulpectomy through case reports and a literature review were analyzed by Lim et al. It was found that over-instrumentation, canal perforation and extrusion of materials were common complications, often leading to treatment failure or adverse tissue reactions. The study highlighted the importance of case selection, technique and experience in reducing risks. Adhering to guidelines and enhancing training can significantly lower iatrogenic errors in pediatric endodontics.[23]

Ashkenazi et al, examined common mistakes, negligence and legal offenses in pediatric dentistry through a self-reported study. It was found that diagnostic errors, treatment delays and inadequate communication were frequent causes of malpractice claims. The study concluded that adherence to clinical guidelines, improved practitioner training and clear patient communication are essential in minimizing legal risks and enhancing patient safety.[24] Luca et al, found that improper occlusal adjustments, ill-fitting prostheses and flawed treatment planning contribute to iatrogenic TMJ and occlusal dysfunctions. Accurate diagnostics, meticulous prosthetic design and adherence to occlusal principles are essential to prevent these complications and maintain occlusal harmony and TMJ health.[25]

Badar et al found that improper crown and bridge preparation techniques often damage adjacent teeth's enamel and dentin, increasing caries and sensitivity risk. Protective measures (e.g., matrix bands, careful bur control) reduce these injuries. Preventive strategies and operator precision are essential to minimize iatrogenic damage and preserve tooth structure.[26] Harish et al, investigated iatrogenic periodontal damage resulting from fixed prosthodontic procedures. It was found that improper margin placement, inadequate crown contouring and poor cementation techniques contribute to periodontal inflammation and attachment loss. In conclusion, precise prosthodontic planning and execution were emphasized to prevent periodontal complications.[27]

Similarly, Abdurahiman et al examined iatrogenic negligence in complete dentures, linking occlusal and border extension errors to discomfort and poor retention. The study stressed accurate diagnosis, precise fabrication and clinician training to prevent issues, concluding that

adherence to prosthodontic principles enhances denture success and patient satisfaction.[28]

Iatrogenic penetration of the mouth floor during mandibular molar extraction was examined by Papadiochos et al. It was found that iatrogenic mouth floor penetration during mandibular molar extraction, caused by improper technique and anatomical unawareness, necessitates emergency intervention. Careful planning, precise execution and anatomical knowledge are crucial to prevent such incidents and minimize severe bleeding and related complications.[29]

Saini et al evaluated iatrogenic errors in restorative dentistry among practicing dentists. It was found that a notable frequency of such errors occurred, indicating lapses in clinical technique and protocol adherence. In conclusion, it was recommended that enhanced training and strict adherence to best practices be implemented to reduce these errors.[30]

The use of haptics technology to minimize iatrogenic errors in operative dentistry was explored by Natarajan et al. It was found that haptics technology enhances precision in operative dentistry, reducing iatrogenic harm by improving tactile sensitivity and control. This technology refines clinical skills and minimizes procedural mistakes, offering a promising tool for increased accuracy and better patient outcomes.[31]

Alsalman et al found that improper implant placement and inadequate pre-operative assessment can cause iatrogenic inferior alveolar nerve compression, leading to pain, paresthesia and functional impairment. Thorough planning, precise technique and advanced imaging are essential to prevent this, emphasizing clinician awareness and adherence to best practices.[32]

Disclosure of iatrogenic mistakes

Al-Nomay et al evaluated attitudes toward medical error disclosure among dental professionals in Riyadh, Saudi Arabia. A generally positive stance was observed, especially for minor errors, while serious errors raised concerns about legal and professional consequences. It was concluded that comprehensive disclosure policies and enhanced ethical training were needed to promote transparency and patient safety.[33] Public preferences on the disclosure of medical errors and the appropriate responsible party were examined by Hammami et al. It was found that errors causing significant harm were expected to be disclosed, with preference given to the treating physician or a senior clinician. It was concluded that existing practices fall short of public expectations, highlighting the need for greater transparency and improved communication to strengthen trust in healthcare.[34]

Blood et al examined the ethical duty of dentists in managing treatment errors. It was found that while errors are unavoidable, ethical responsibility necessitates acknowledgment and corrective action. Open disclosure and clear patient communication were emphasized as vital for maintaining trust. It was concluded that adherence to ethical standards and proactive error management enhance patient confidence and improve dental care quality.[35]

On the other hand, Rosen et al examined the legal obligations of dentists to disclose unintended outcomes, emphasizing that failure to inform patients about adverse events can lead to legal consequences. It was highlighted that open communication and transparency are essential in maintaining patient trust and fulfilling professional duties. The article concluded that dentists must adhere to ethical and legal standards by promptly disclosing any adverse outcomes to patient.[12]

Effectiveness of disclosure

Fein et al, identified transparency, harm acknowledgment, error explanation and preventative measures as key elements of effective error disclosure. Inconsistent practices contribute to patient dissatisfaction and diminished trust. A standardized definition and framework are needed for consistent, improved patient-provider communication and enhanced trust.[36]

Kaldjian et al developed a taxonomy of factors influencing physicians' willingness to disclose medical errors. It was identified that Error severity, professional duty, patient relations and institutional culture influence disclosure decisions. Legal, reputational and patient reaction concerns often hinder full disclosure. A supportive environment, ethical emphasis and communication training are essential for transparent error disclosure.[37]

An interesting study by Mazor et al, examined factors influencing patient responses to medical error disclosure. It was found that patient reactions were influenced by error severity, harm extent and disclosure approach. Full acknowledgment and apology fostered trust, while evasive responses led to dissatisfaction. Transparent communication, empathetic disclosure and clear corrective actions were concluded to be crucial in maintaining trust and reducing negative outcomes.[38] Hébert et al discussed the ethical duty of disclosing medical errors, emphasizing that full transparency-acknowledgment, explanation and prevention-maintains trust and integrity. Fear of litigation and reputation concerns were noted as barriers. It was concluded that promoting openness, enhancing communication and providing institutional support can improve disclosure and patient-provider relationships.[39]

Xiong et al outlined a protocol for a qualitative systematic review on medical error disclosure, noting the lack of comprehensive synthesis on practices, influencing factors and patient perceptions. Themes related to ethics, legal

aspects and communication strategies were analyzed. It was concluded that a structured disclosure approach is essential for transparency, patient trust and professional accountability.[40]

Challenges and barriers to disclosure

Kaldjian et al found that while physicians and trainees generally acknowledged the ethical duty to disclose medical errors, actual disclosure practices varied, often due to liability and reputational concerns. They recommended enhanced training and institutional support to improve disclosure practices and align them with ethical standards for better patient safety.[41]

Similarly, Kalra et al discussed the importance of medical error disclosure from an ethical and professional perspective. It was found that transparency in error disclosure builds trust, enhances safety and fulfills ethical duties. However, fear of litigation, reputational concerns and lack of institutional support often hinder disclosure. A supportive culture, communication training and clear policies are essential to encourage error acknowledgment and maintain patient confidence.[42] Moreover, Kapp et al examined the legal concerns associated with medical error disclosure, highlighting barriers that prevent transparency. It was found that fear of malpractice and professional repercussions often deters error admission, with legal anxieties sometimes used as a pretext for non-disclosure. Open communication, legal protections and ethical responsibility are essential to overcome these obstacles and promote patient-centered care.[43]

Greely et al explored the ethical and legal obligations of physicians to disclose medical errors, emphasizing the conflict between professional responsibility and liability concerns. It was found that despite ethical guidelines favoring transparency, fear of malpractice often discourages full disclosure. An open culture, supported by legal protections and institutional policies, is essential for honest communication and patient trust.[44] In a similar study, Renwick et al, examined whether doctors should disclose medical mistakes, highlighting ethical obligations and patient expectations. It was found that while transparency is encouraged, concerns about legal repercussions and professional reputation often hinder full disclosure. It was concluded that open communication fosters trust and ethical integrity and supportive policies are necessary to encourage error disclosure while protecting both patients and practitioners.[45]

DISCUSSION

Iatrogenic mistake types

Iatrogenic mistakes in dentistry arise from a complex interplay of factors, including inadequate knowledge, improper technique and systemic issues. One study highlighted the role of anatomical ignorance in surgical errors, emphasizing the need for better anatomical education.[14] Improper clinical techniques and instrumentation are frequent causes of damage to hard tissues.[15,26,30] Orthodontic complications, such as root resorption and periodontal damage, can result from excessive forces, improper biomechanics and poor patient compliance.[18,19] Periodontal damage can be caused by improper restorations, orthodontic forces, surgical trauma and even laser treatment.[1,7,20]

Endodontic errors, including perforations and instrument fractures, are also prevalent, highlighting the need for improved training and adherence to protocols.[21-23] Prosthodontic issues, such as ill-fitting prostheses and improper margin placement, can lead to TMJ dysfunction, periodontal problems and discomfort.[25,27,28] Even extractions can result in iatrogenic damage, such as mouth floor penetration.[29] Systemic factors, including poor communication and inadequate training, contribute to iatrogenic errors Legal risks associated with errors and malpractice are also a significant concern.[16,17,24]

Technological advancements, like haptics technology, offer potential solutions for minimizing iatrogenic harm.[31] Implant dentistry also carries risks, such as nerve compression, emphasizing the importance of thorough planning and precise technique.[32] Overall, these findings underscore the need for improved training, adherence to protocols and a focus on patient safety to minimize iatrogenic mistakes across all dental specialties.

Disclosure of iatrogenic mistakes

Disclosure of iatrogenic mistakes in dentistry is a complex issue involving ethical, legal and patient perspectives. Dental professionals in Riyadh showed positive attitudes toward error disclosure, especially for minor errors, though serious errors raised legal concerns.[33] Public expectations for disclosing significant harm, preferably by the treating physician, revealed a gap between practice and expectation.[34] Ethical duty to acknowledge and correct errors, with open communication, was emphasized as vital for trust.[35] Legal obligations to disclose unintended outcomes, with potential consequences for non-disclosure, were also highlighted.[12] These studies collectively emphasize the need for improved disclosure policies, ethical training and transparency to align practice with ethical, legal and public expectations.

Effectiveness of disclosure

Effective error disclosure requires a multifaceted approach. Key elements include transparency, harm acknowledgment, error explanation and preventative measures, necessitating standardized definitions and frameworks to address inconsistent practices and improve communication.[36] Physician willingness to disclose is influenced by error severity, professional duty, patient relations and institutional culture, with legal and

reputational concerns often hindering full disclosure.[37] Patient responses are affected by error severity, harm extent and disclosure approach; full acknowledgment and apology foster trust, while evasiveness leads to dissatisfaction.[38]

Ethical duty demands full transparency (acknowledgment, explanation, prevention), though litigation and reputation concerns are barriers. A structured disclosure approach is crucial for transparency, patient trust and accountability.[39,40] Collectively, these findings highlight the need for standardized, transparent, empathetic disclosure, supported by institutional changes, ethical training and clear protocols, to foster patient trust and improve outcomes.

Challenges and barriers to disclosure

Despite widespread acknowledgment of the ethical duty to disclose medical errors, actual practice is often hampered by significant challenges.[41,42,45] Liability and reputational concerns are primary deterrents, with fear of malpractice litigation and professional repercussions frequently preventing error admission.[41-45] This conflict between ethical obligations and liability concerns is compounded by a lack of institutional support further hindering open communication.[42,44] To overcome these obstacles, enhanced training, supportive institutional cultures, clear policies, legal protections and communication training are crucial for fostering transparency, maintaining patient trust and promoting patient-centered care.[41-45]

Collectively, these studies reveal that despite ethical imperatives and patient expectations, fear of legal repercussions and damage to professional reputation are major impediments to error disclosure. Supportive institutional cultures, clear policies, communication training and legal protections are crucial to overcome these barriers and promote open communication for enhanced patient safety and trust.

CONCLUSION

Dental iatrogenic mistakes, arising from inadequate knowledge, improper techniques and systemic issues, impact all specialties. Surgical, endodontic, orthodontic, prosthodontic and extraction errors underscore the need for better training, protocol adherence and technology integration. Disclosing these mistakes is complex, influenced by ethical, legal and patient factors. While minor errors are often disclosed, serious errors face barriers due to litigation and reputational concerns. Clearer policies and ethical training are needed to align practice with patient expectations.

Effective disclosure requires structured communication (harm acknowledgment, explanation, prevention), standardized frameworks and institutional support. However, fear of malpractice and reputational damage hinder full disclosure, necessitating supportive cultures, legal protections and communication training. Ultimately, improved disclosure requires balancing patient safety with legal/institutional challenges, establishing clear guidelines, fostering openness and implementing effective training to enhance trust and promote ethical care.

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