

Review

Quality Management and Internal Audit in Dental Practices in Romania: Current Issues of Public Health and Development Perspectives

Elena Raluca Baciú , Ionut Luchian * , Dana Gabriela Budala , Ionut Taraboanta , Razvan Constantin Branzan and Iulian Costin Lupu 

Grigore T. Popa University of Medicine and Pharmacy, 700115 Iasi, Romania; elena.baciu@umfiasi.ro (E.R.B.); ionut-taraboanta@umfiasi.ro (I.T.); iulian.lupu@umfiasi.ro (I.C.L.)

* Correspondence: ionut.luchian@umfiasi.ro

Abstract

Quality management and internal audit are important components of patient safety, regulatory compliance, and service quality in dental practice. This narrative review examined the current status of quality management and internal audit in Romanian dental settings and explored challenges and future development opportunities in relation to European quality standards. A narrative review of the literature was conducted using PubMed, Scopus, Web of Science, and Google Scholar, complemented by an analysis of Romanian regulatory documents relevant to dental practice. The reviewed evidence suggests that quality management in Romanian dental services remains largely focused on regulatory compliance, particularly infection control and documentation requirements. Internal audit is rarely implemented as a structured tool for continuous quality improvement, while the lack of standardized audit frameworks and quality indicators limits objective performance evaluation. Additional challenges include variability in organizational resources, limited audit-related training, and uneven digital integration. Strengthening internal audit procedures and developing standardized quality-management frameworks may support continuous quality improvement and closer alignment with European quality standards.

Keywords: quality management; internal audit; dental practice; quality indicators; infection control

1. Introduction

Quality management has become a fundamental component of modern healthcare systems, reflecting the growing need for patient safety, regulatory compliance, and performance optimization. In dental practice, where clinical precision, infection control, and patient-centered care are essential, structured quality management systems (QMS) play a critical role in ensuring consistent standards of care. Beyond clinical competence, contemporary dental services increasingly require organized administrative processes, documented protocols, and measurable performance indicators [1].

Internal audit represents one of the core mechanisms supporting quality management. Unlike external inspections conducted by regulatory authorities, internal audit is a proactive, systematic, and continuous process designed to evaluate compliance, identify risks, and improve organizational performance from within the practice [2,3]. Clinical audit represents a specific component of the broader internal audit process and focuses primarily on evaluating clinical activities against predefined standards and evidence-based



Academic Editor: Andrea Spinazzè

Received: 25 May 2026

Revised: 30 June 2026

Accepted: 6 July 2026

Published: 9 July 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

recommendations. In dental settings, internal audit may encompass clinical protocols, sterilization procedures, documentation accuracy, financial transparency, occupational safety, and patient feedback systems. When properly implemented, internal audit contributes not only to regulatory adherence but also to strategic development and operational efficiency [4].

In Romania, dental practices operate within a regulatory framework that includes public health requirements, professional standards, and infection control regulations. However, the level of structured quality management implementation varies considerably between practices, particularly between individual private offices and larger multidisciplinary clinics [5]. In many cases, internal audit procedures are applied reactively—primarily in response to inspections—rather than as part of a continuous quality improvement strategy. This situation highlights the need for a clearer integration of quality management principles into routine dental practice. In Romania, the provision of dental care is predominantly based on private practice, operating within a regulatory framework established by national healthcare legislation and the Romanian College of Dentists. Professional activity is governed by requirements related to ethical conduct, continuing professional development, clinical documentation, patient safety, infection-control procedures, and professional accountability. These regulatory mechanisms create the foundation for quality assurance in dental practice and define the minimum standards that must be respected during the delivery of oral healthcare services. At the same time, the increasing complexity of contemporary dental care highlights the need to complement regulatory compliance with structured quality-management approaches capable of supporting continuous performance evaluation, risk reduction, and service improvement. Such an approach is particularly relevant in the context of ongoing digitalization, growing patient expectations, and the increasing emphasis on evidence-based healthcare management.

The aim of this review is to analyze the current status of quality management and internal audit in dental practices in Romania, to identify existing challenges and gaps, and to explore development perspectives aligned with international standards. By synthesizing regulatory, managerial, and clinical dimensions, this paper seeks to provide a structured framework that supports both compliance and sustainable performance improvement in Romanian dental healthcare settings.

2. Materials and Methods

2.1. Study Design

This study was designed as a narrative review aimed at evaluating the current status of quality management and internal audit implementation in Romanian dental practice and identifying future development perspectives in relation to European quality standards. Given the limited availability of studies specifically addressing internal audit systems in Romanian dentistry, the review adopted a broad analytical approach, integrating scientific literature, professional guidance documents, and national regulatory frameworks relevant to quality assurance, patient safety, infection control, and healthcare governance. The objective was not only to summarize the available evidence but also to identify current challenges, implementation barriers, and potential strategies for improving quality management practices within Romanian dental services.

2.2. Information Sources and Search Strategy

A comprehensive literature search was conducted covering the period between 2000 and 2025. The electronic databases PubMed, Scopus, Web of Science, and Google Scholar were systematically consulted. These databases were selected to ensure broad coverage

of the scientific literature related to healthcare quality management, clinical governance, audit procedures, patient safety, infection control, and dental practice.

The search strategy included combinations of the following keywords: quality management, internal audit, clinical governance, dental practice, healthcare quality systems, risk management, Romania, and European Union standards. Boolean operators (AND, OR) were applied to refine the results and ensure relevance. Representative search strings included: (“quality management” OR “quality assurance”) AND (“internal audit” OR “clinical audit”) AND (“dental practice” OR dentistry OR “oral healthcare”), as well as combinations including “clinical governance”, “risk management”, “patient safety”, “infection control”, “Romania”, and “European Union”.

Because publications specifically addressing quality management and internal audit in Romanian dental practice remain limited, the search was expanded to include studies from the broader fields of healthcare quality management, outpatient healthcare services, and healthcare governance when their findings were considered applicable to dental settings.

The literature selection process was performed following a structured narrative review approach (Figure 1). The initial database search identified 88 records. After removing 13 duplicate publications, 75 records remained for title and abstract screening. Following the initial screening, 21 publications were excluded because they were not relevant to the objectives of the review.

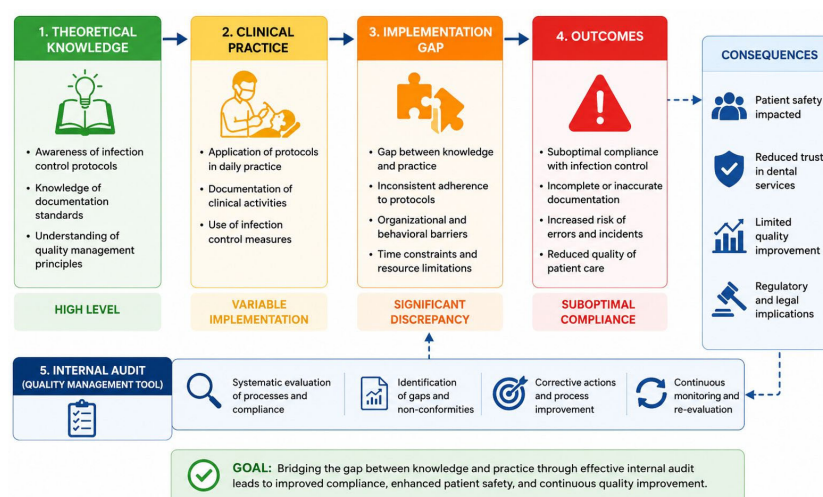


Figure 1. Discrepancy between Theoretical Knowledge and Clinical Implementation in Romanian Dental Practice: The Role of Internal Audit in Quality Improvement.

The remaining 54 full-text articles were assessed for eligibility according to the predefined inclusion and exclusion criteria. During the eligibility assessment, eight studies were excluded because they did not meet the methodological or thematic requirements of the review. Consequently, 46 studies were included in the final narrative synthesis.

The screening and selection process was conducted independently by two reviewers. Any disagreements regarding study eligibility were resolved through discussion until consensus was achieved.

2.3. Regulatory and Professional Sources

In addition to peer-reviewed scientific publications, national regulatory documents and professional guidelines applicable to dental practice in Romania were analyzed. These included legislative frameworks governing infection control, patient safety, documentation standards, and professional oversight requirements. The inclusion of these documents was considered essential because many aspects of quality management and audit implementa-

tion in Romanian dental practice are influenced by regulatory requirements rather than being extensively addressed in the scientific literature.

2.4. Eligibility Criteria and Source Selection

Sources were considered eligible if they addressed quality management systems, quality assurance, internal audit procedures, clinical governance, patient safety, infection control, risk management, or healthcare performance evaluation in dental or outpatient healthcare settings.

Publications written in English or Romanian were considered for inclusion. Studies focusing exclusively on hospital accreditation systems without relevance to outpatient healthcare or dental practice were excluded. Editorials, opinion papers, and publications lacking sufficient methodological or analytical content were also excluded.

Source selection was based on relevance to the objectives of the review. Additional publications were identified through manual examination of the reference lists of selected articles.

2.5. Data Extraction and Thematic Analysis

The selected scientific publications, regulatory documents, and professional guidance materials were reviewed and analyzed using a thematic synthesis approach. Relevant information was extracted and grouped into major analytical domains reflecting the objectives of the study.

Following repeated review of the selected sources, the evidence was organized into the following thematic categories: regulatory framework, quality management systems in dental practice, internal audit implementation, barriers to implementation, current Romanian practices, and future development perspectives.

This thematic approach allowed the integration of scientific evidence, regulatory requirements, and professional recommendations into a unified framework describing the current status and future directions of quality management and internal audit in Romanian dental practice.

To the best of our knowledge, this is one of the first narrative reviews specifically focused on the integration of quality management and internal audit within Romanian dental practice. While previous studies have addressed infection control, healthcare quality, or oral health policies separately, limited attention has been given to the relationship between internal audit systems, quality management structures, regulatory requirements, and clinical governance in Romanian dentistry. The novelty of the present review lies in its integration of regulatory, managerial, public health, and clinical perspectives into a unified framework, while also highlighting current gaps and future development opportunities aligned with European quality standards.

As a narrative review, this study may be subject to limitations related to selection bias and heterogeneity of the analyzed sources. However, efforts were made to ensure methodological transparency and comprehensive thematic coverage in order to provide a balanced and analytically grounded perspective.

3. Conceptual Framework of Quality Management in Dental Practice

Quality management in dental practice represents a structured system of procedures and standards designed to ensure safe, predictable, and efficient clinical outcomes. In dentistry, quality is closely associated with the control of biological risks, consistency of clinical protocols, and the ability to deliver reproducible treatment results in outpatient settings, where most dental care is provided.

A central component of quality management in dental practice is infection prevention and control, which aims to minimize the risk of disease transmission and ensure a safe clinical environment for both patients and healthcare professionals [6]. Effective infection control requires clearly defined protocols, appropriate use of personal protective equipment, and strict adherence to sterilization and decontamination procedures [7]. However, studies have shown that although many dental practices report the existence of such protocols, their documentation and consistent implementation remain suboptimal, highlighting the need for structured quality management systems [8,9].

The structure–process–outcome framework is one of the most popular examples of how standardized quality management methods have been adapted for use in dentistry. For a thorough evaluation of dental practice quality, this model considers all three aspects of the system: the structure of the organization, the process of care delivery, and the clinical and patient-reported outcomes [10]. Clinical performance and patient satisfaction are two important measures of service quality that are integrated into contemporary quality management systems, which also place an emphasis on patient-centered care, risk management, and continuous improvement [10]. An effective quality management system must include standardized protocols, ongoing staff training, and regular assessments of clinical practices [11].

As a practical instrument that strengthens quality management, internal audit is crucial in this respect. By systematically comparing current practice to established criteria, clinical audits help to identify irregularities and put remedial measures into action [6]. Consequently, audit procedures are important to quality management in dental practice because they supply the objective data needed to guarantee compliance, enhance clinical performance, and maintain high patient care standards.

In practical dental settings, quality management directly influences routine clinical activities, including sterilization workflows, maintenance of dental equipment, traceability of materials, radiological safety procedures, and documentation of patient records. Internal audit provides a structured mechanism for evaluating whether these processes are performed consistently and in accordance with regulatory requirements, thereby contributing to patient safety and reducing clinical risk. While audit is implicitly addressed through inspection, in contrast, external inspections are performed by regulatory authorities and are primarily intended to verify compliance with legal and professional requirements.

4. Internal Audit and Romanian Legislation Regarding Dental Practice

By offering a methodical and organized framework for assessing clinical performance, compliance with standards, and the efficacy of established protocols, internal audits are an essential part of quality management systems in dental practices. Internal audits, in contrast to external inspections, are practice-driven and ongoing processes that seek to improve patient safety, workflow, and the identification of irregularities [12].

The primary goal of an internal audit at a dental practice is to ensure that all procedures are following the approved clinical and organizational guidelines. Procedures for controlling infections, standards for sterilization, correct documentation, radiation safety, and the capacity to track treatment supplies and devices are all important areas to consider. Adherence to infection control standards is especially crucial in the dentistry field because of the high exposure to biological threats and the invasive nature of several operations [12–14]. In dental practice, internal audit may include verification of sterilization records, biological monitoring of autoclaves, traceability of implantable materials, documentation of informed consent, radiation protection measures, and management of clinical incidents. These indicators are directly linked to patient safety and represent measurable components of quality assurance.

As a subset of internal auditing, clinical audits compare existing clinical practices to established standards or guidelines, and then address any inconsistencies found. Continuous quality improvement and the maintenance of dental care’s alignment with evidence-based standards are both supported by this cyclical process, which is commonly defined as “plan–do–check–act” [15].

Promoting quality culture in dental offices is one of the primary goals of internal auditing. Audit processes should not be seen as an administrative burden, but as an opportunity to promote professional growth, improve teamwork, and keep dental staff members responsible. Improvements in documentation standards and attention to infection control measures are evident in practices that use regular audit cycles [14].

The incorporation of digital resources and electronic health records (EHRs) presents new opportunities to improve internal audit procedures, which is aligned with current trends in healthcare quality evaluation. Supporting evidence-based decision-making and allowing for real-time evaluation of clinical performance are automated monitoring systems and standardized data collecting [16].

Studies consistently demonstrate that, despite relatively high levels of theoretical knowledge, compliance with infection control protocols in dental practice remains inconsistent. Observational data indicate that adherence to essential measures such as hand hygiene is frequently suboptimal, while targeted interventions, including training and audit cycles, significantly improve compliance. Furthermore, evidence from both international and Romanian contexts highlights the need for standardized audit frameworks and continuous monitoring to ensure effective implementation of quality management systems in dental practice, as illustrated in Table 1.

Table 1. Evidence illustrating the gap between theoretical knowledge, protocol availability, and clinical implementation in dental practice.

Author/Year	Study Type	Sample/Setting	Evaluated Parameter	Key Findings	Relevance to Quality Management and Internal Audit
Myers, R.; et al. 2018 [17]	Systematic review	Dental settings	Hand hygiene compliance	Mean compliance ~34.7%	Demonstrates the need for monitoring and audit procedures
Cleveland, J.L. et al. 2016 [18]	Review / surveillance data	Dental healthcare settings (USA)	Infection control implementation	High variability in protocol adherence	Highlights the importance of standardized quality-control systems
Mutters, N.T.; et al. 2014 [19]	Observational	University dental clinic (Germany)	IPC compliance	Low hand hygiene compliance despite PPE use	Supports the need for internal audit and feedback mechanisms
Erasmus, V. et al. 2010 [20]	Systematic review	Healthcare workers (incl. dental)	Hand hygiene compliance	Average compliance ~40%	Indicates that training and monitoring are essential
Allegranzi, B.; et al. 2022 [21]	Review	Healthcare settings	Infection control practices	Compliance remains suboptimal globally	Supports audit-based quality improvement
Alkadi, L.; et al. 2024 [22]	Cross-sectional	Dental students and professionals	Knowledge vs. practice	Good knowledge, variable implementation	Demonstrates the importance of continuous evaluation

4.1. Current Status and Barriers to the Implementation of Quality Management and Internal Audit in Romanian Dental Practice

Compliance with infection control methods and documentation standards varies significantly among dental practices, reflecting inconsistencies in the implementation of quality management and internal audit systems [23]. Although dental environments are

traditionally considered potential risk settings due to exposure to biological hazards, current evidence does not identify dental practices as confirmed sources of infection transmission in routine clinical conditions [24,25].

There is currently no consistent evidence indicating dental practices as confirmed sources of infection transmission in routine clinical settings. Although dental environments represent potential risk settings, no post-COVID-19 data have demonstrated infections directly associated with dental visits. This suggests that the main issue is not the inherent risk of dental practice, but the inconsistent implementation of protocols and lack of monitoring [26].

This distinction is essential, as it shifts the focus from perceived clinical risk to systemic deficiencies. Studies consistently show that compliance with infection control measures remains inconsistent, particularly in areas such as hand hygiene, sterilization workflows, and documentation accuracy [27–29]. The gap between theoretical knowledge and clinical implementation is therefore primarily related to behavioral and organizational factors rather than to the absence of established protocols.

In the Romanian context, these limitations are further amplified by structural gaps in the healthcare system [30]. Quality management remains predominantly compliance-driven, with limited integration into continuous improvement models. Existing legislation provides general requirements for infection control and documentation; however, it lacks specific frameworks adapted to dental practice, particularly in relation to internal audit, performance monitoring, and continuous quality improvement. Consequently, quality-related activities are frequently centered on demonstrating compliance with legal and professional requirements rather than on the systematic evaluation of clinical performance and service outcomes.

In Romania, dental care is delivered predominantly through private practices operating within a regulatory framework established by the Ministry of Health and the Romanian College of Dentists. Romanian studies have described important challenges related to healthcare organization, dental practice management, professional training, and service delivery, while also reporting variability in organizational resources and managerial capacity among dental practices [30–33]. Current legislation establishes mandatory requirements regarding infection prevention and control, sterilization, documentation, professional responsibility, and patient safety [34–38]. However, neither the available Romanian scientific literature nor the current regulatory framework provides a standardized national model specifically addressing the implementation of structured internal audit systems, audit-based performance monitoring, or continuous quality improvement in dental practice. Consequently, the available evidence suggests that quality-related activities are primarily oriented toward compliance with statutory and professional requirements, whereas the implementation of structured internal audit systems remains insufficiently documented in the Romanian literature.

Another important limitation is the reduced implementation of internal audit as a structured and cyclical process. In most cases, quality assessment activities are informal or associated with external inspections rather than continuous internal evaluation, while structured internal audit procedures remain uncommon. This limits the use of internal audit as a tool for continuous quality improvement.

From a clinical perspective, the absence of structured audit systems may affect several aspects of dental care, including documentation quality, compliance with sterilization protocols, monitoring of treatment outcomes, management of adverse events, and evaluation of patient satisfaction. As a result, quality assessment frequently remains focused on regulatory compliance rather than on comprehensive performance evaluation and outcome measurement.

A distinctive characteristic of the Romanian dental sector is the predominance of small private practices operating independently, often with limited administrative resources and without dedicated quality-management personnel. Unlike large healthcare institutions, dental offices frequently rely on the direct involvement of practitioners in both clinical and managerial activities. Consequently, the implementation of quality-management initiatives and internal audit procedures may vary considerably between practices. This organizational model contributes to substantial variability in the adoption of quality-management strategies and limits the development of standardized audit-based performance evaluation systems.

Another defining characteristic of current practice in Romania is the limited use of internal audit as a structured and cyclical process. Evaluation of clinical activity is rarely performed through formal audit cycles involving predefined indicators, systematic data collection, benchmarking, implementation of corrective measures, and reassessment of outcomes. Instead, monitoring activities are frequently fragmented and linked to external inspections, administrative controls, or isolated internal reviews. Similar challenges have been reported in broader healthcare settings, where monitoring systems often remain insufficiently standardized and inadequately integrated into continuous quality-improvement models [33].

In addition, the implementation of quality-management practices is influenced by variability in professional training, resource availability, organizational structure, and managerial capacity [39]. Audit methodology, quality indicators, and performance evaluation are not consistently incorporated into routine professional activities, which may reduce awareness of the potential benefits associated with structured internal audit systems. Consequently, quality-management initiatives are frequently perceived as regulatory obligations rather than strategic tools for organizational development and service improvement.

The integration of digital systems into routine dental practice is also uneven. Although electronic health records are increasingly adopted, their use remains focused primarily on administrative and documentation functions. Their potential contribution to performance monitoring, audit activities, quality-indicator tracking, and data-driven decision-making remains underutilized. This limitation has also been highlighted in recent studies emphasizing the need for standardized evaluation frameworks for healthcare documentation systems and dental records [31,32,40]. Standardized documentation facilitates traceability, supports performance evaluation, and enables more effective implementation of quality-improvement initiatives. Without reliable documentation systems, the effectiveness of audit procedures and quality-monitoring activities remains inherently limited.

To better illustrate the discrepancy between theoretical knowledge and actual clinical practice in dental settings, a schematic representation is provided in Figure 1 that illustrates that the principal challenge in Romanian dental practice is not the absence of professional knowledge or regulatory requirements, but the progressive decline in compliance during implementation. The model suggests that quality-management deficiencies emerge primarily at the transition from theoretical knowledge to routine clinical practice. In this context, internal audit may serve as a critical mechanism for identifying implementation gaps, monitoring adherence to established protocols, and supporting corrective actions. Consequently, the figure highlights the potential role of audit-based quality improvement in reducing the discrepancy between knowledge, implementation, and clinical performance.

The conceptual model presented in Figure 1 is based on the evidence synthesized in the reviewed literature. Studies consistently indicate that although regulatory requirements and professional knowledge regarding infection prevention and quality assurance are well established, variability persists in their implementation during routine clinical practice. This discrepancy has been associated with organizational, managerial, and educational

factors rather than with deficiencies in the regulatory framework itself. Within this context, internal audit represents a structured mechanism capable of identifying implementation gaps, monitoring compliance with predefined standards, supporting corrective actions, and facilitating continuous quality improvement.

It should be acknowledged that comprehensive national data regarding the implementation of quality management systems and internal audit practices in Romanian dental offices remain limited. Consequently, some observations presented in this review are derived from the interpretation of the available literature, regulatory documents, professional guidance, and broader healthcare management evidence rather than from dedicated nationwide studies specifically evaluating Romanian dental practices. This limitation should be considered when interpreting the current organizational and managerial challenges discussed in the present review.

4.2. Regulatory and Legislative Framework in Romania

The organization and functioning of dental practices in Romania are regulated by a combination of national legislation, professional guidelines, and public health regulations aimed at ensuring patient safety and quality of care [34]. These regulations establish the minimum requirements for infection control, sterilization procedures, documentation, and professional conduct [35].

A central role is played by the Ministry of Health, which establishes the regulatory framework governing the authorization and operation of healthcare units, including dental practices, through national legislation such as Law no. 95/2006 on healthcare reform, Order no. 1101/2016 on the prevention of healthcare-associated infections, Order no. 1761/2021 approving hygiene norms in healthcare units, and Order no. 1226/2012 on the management of medical waste. These regulations define mandatory standards related to hygiene, sterilization, infection control, waste management, and occupational safety, which must be implemented in all healthcare facilities [36]. In addition, periodic inspections are conducted to verify compliance with these requirements.

The analyzed regulations provide the legal basis for quality assurance and patient safety in Romanian dental practice, although they primarily focus on regulatory compliance rather than structured quality management. Law no. 95/2006 on healthcare reform establishes the general framework governing healthcare services, professional responsibility, patient rights, and quality assurance within the Romanian healthcare system. Order no. 1101/2016 establishes measures for the prevention, surveillance, and control of healthcare-associated infections, including requirements relevant to infection-control procedures in dental settings. Order no. 1226/2012 regulates the management of medical waste generated during healthcare activities, contributing to patient safety, occupational safety, and environmental protection. Order no. 1761/2021 updates technical standards related to cleaning, disinfection, and sterilization activities within healthcare services. However, although these regulations define important obligations related to safety, hygiene, documentation, and professional practice, they do not provide a standardized framework for the implementation of internal audit systems, quality indicators, performance benchmarking, or continuous quality-improvement cycles in dental practice. Consequently, compliance with existing regulations does not necessarily ensure the implementation of structured quality-management systems at the practice level.

The Romanian College of Dentists contributes to the regulatory framework by establishing professional standards, ethical guidelines, and requirements for continuous professional development [37]. These guidelines support clinical practice; however, they do not always include detailed frameworks for structured quality management or internal audit implementation.

Infection control is one of the most strictly regulated domains, with clear protocols regarding sterilization procedures, use of personal protective equipment, and prevention of cross-contamination [38]. However, while these regulations define what should be implemented, they do not provide standardized mechanisms for continuous monitoring or internal audit.

Furthermore, documentation requirements are regulated, including patient records, informed consent, and traceability of materials. Despite this, there is no unified national system for evaluating the quality of documentation or integrating these data into audit processes [41,42].

An important limitation of the current legislative framework is the absence of explicit regulations regarding internal audit in dental practice. While compliance verification is addressed through inspections and regulatory controls, internal audit is not formally defined as a structured, cyclical process integrated into quality management systems.

4.3. Barriers to Implementation

The limited implementation of quality management and internal audit in Romanian dental practice is not primarily caused by the absence of clinical protocols, but by their inconsistent application and insufficient integration into structured monitoring systems. This distinction is essential, as it reflects a systemic issue rather than a clinical one.

The lack of audit culture may also limit the identification of recurrent clinical deficiencies, such as incomplete documentation, inadequate infection-control monitoring, or inconsistent implementation of clinical protocols. As a result, opportunities for preventive quality improvement are frequently missed.

A major barrier is the lack of formal training in audit methodology and quality management principles within both undergraduate education and continuing professional development. As a result, internal audit is frequently perceived as a regulatory or administrative requirement, rather than as a clinical tool for performance improvement. This perception significantly reduces practitioner engagement and limits the effective use of audit cycles.

Another critical limitation is the absence of standardized, dental-specific quality indicators. In the absence of clearly defined benchmarks, evaluation of clinical performance remains subjective, fragmented, and difficult to compare across practices. This lack of standardization prevents the development of consistent quality improvement strategies and limits the use of objective performance data.

In the Romanian context, structural characteristics of dental services further amplify these limitations. The predominance of small private practices restricts access to resources, time, and dedicated personnel required for implementing structured audit systems. Consequently, quality management activities are often reduced to minimal compliance with regulatory requirements, without systematic monitoring or evaluation.

Deficiencies in documentation practices represent an additional barrier. Incomplete or inconsistently maintained clinical records reduce traceability and limit the ability to perform retrospective evaluation or audit-based analysis. At the same time, the limited integration of digital systems further constrains the possibility of implementing data-driven quality management approaches.

Legislative limitations also contribute to the problem. Although general healthcare regulations define infection control and safety requirements, there are no clear, dental-specific frameworks that mandate or guide the implementation of internal audit as a structured process. This results in a gap between regulatory compliance and effective quality management.

5. Opportunities and Development Perspectives

The limitations identified in the current implementation of quality management and internal audit in Romanian dental practice also highlight several opportunities for system-level improvement and professional development.

A key direction is the development of standardized audit frameworks tailored specifically to dental practice. The introduction of clearly defined indicators related to infection control, documentation quality, traceability of materials, and patient safety would enable objective evaluation and facilitate comparability between practices. Such standardization is essential for transitioning from a compliance-based approach to a performance-oriented model.

The expansion of digital infrastructure represents another important opportunity. The increasing adoption of electronic health records in Romania creates the potential for structured data collection, real-time monitoring, and integration of audit processes into routine clinical activity. Standardized evaluation of digital records has already been identified as a critical component of modern quality management systems, supporting consistency, transparency, and data-driven decision-making.

Professional education and training also play a central role in advancing quality management practices. Integrating audit methodology and quality improvement strategies into undergraduate curricula and continuing education programs would enhance practitioners' ability to implement structured audit cycles and use audit outcomes to improve clinical performance. This shift is necessary to reposition audit from an administrative obligation to a clinical improvement tool.

At the organizational level, promoting a culture of quality within dental practices is essential. Encouraging team-based approaches, continuous feedback, and accountability mechanisms can significantly improve adherence to protocols and the effectiveness of audit processes. In this context, internal audit should be integrated as a routine activity rather than an occasional or externally driven requirement.

Finally, the integration of audit processes with broader healthcare monitoring systems could enhance consistency across medical and dental sectors. Given the systemic challenges identified in Romanian healthcare, strengthening audit-based quality management in dentistry may contribute to improving patient safety and reducing variability in clinical practice.

A preliminary framework for internal audit implementation in Romanian dental practice may be organized around five core domains: (1) infection prevention and control, (2) clinical documentation and traceability, (3) patient safety and risk management, (4) patient-centered care and satisfaction, and (5) professional development and regulatory compliance. Within these domains, measurable indicators could include sterilization monitoring records, completeness of clinical documentation, informed consent compliance, adverse event reporting, patient satisfaction assessment, continuing professional development participation, and adherence to national professional guidelines. Regular monitoring of these indicators through structured audit cycles may facilitate continuous quality improvement and provide a practical foundation for future development of standardized audit frameworks adapted to Romanian dental practice.

Beyond individual dental practices, the implementation of standardized audit systems may generate broader public health benefits by improving patient safety, reducing variability in service quality, enhancing infection-control compliance, and supporting evidence-based healthcare planning. From a public health perspective, audit-driven quality management may contribute to greater transparency, accountability, and efficiency within the dental care system.

6. Research Gaps

Despite the growing interest in healthcare quality management and patient safety, important knowledge gaps remain regarding the implementation of quality management systems and internal audit in Romanian dental practice. Most Romanian publications have focused on infection control, oral health policies, healthcare management, patient satisfaction, or organizational aspects of dental services. While these studies provide valuable information regarding selected components of healthcare quality, they do not specifically evaluate the structure, implementation, or effectiveness of internal audit systems within dental practices.

Furthermore, the available Romanian literature provides limited evidence regarding the use of standardized audit procedures, quality indicators, performance monitoring systems, or audit-based quality improvement strategies in dentistry. No national framework specifically addressing internal audit implementation in dental practice was identified, and few studies have explored how audit activities influence clinical performance, patient safety, documentation quality, or organizational efficiency. Consequently, current knowledge remains fragmented, making it difficult to objectively assess the level of implementation of quality management principles within Romanian dental services.

A major limitation is the absence of studies specifically addressing the implementation of structured internal audit systems in dental settings. Most available Romanian research focuses on infection control practices, antimicrobial resistance, or general healthcare-associated infections, without evaluating audit cycles, performance indicators, or quality improvement mechanisms at the level of dental practice [42–44]. This lack of evidence limits the ability to assess how audit processes are currently applied and whether they have a measurable impact on clinical outcomes.

Another important gap is the absence of validated, dental-specific quality indicators adapted to the Romanian healthcare system. Without standardized metrics, it is difficult to objectively evaluate clinical performance, compare practices, or establish benchmarking systems. This represents a critical limitation for both research and practical implementation of quality management strategies.

Furthermore, there is a lack of comparative studies evaluating differences between types of dental practices (e.g., private vs. institutional settings) or assessing the influence of factors such as training, resources, and organizational structure on the implementation of audit systems. Such data would be essential for identifying targeted interventions and optimizing quality management strategies.

Finally, the relationship between audit implementation and clinical outcomes—such as reduction in infection rates, improvement in documentation quality, or patient safety indicators—remains largely unexplored in Romanian dental practice [45,46]. Addressing this gap would provide evidence-based justification for the integration of audit as a core component of quality management systems.

Although the present review aimed to provide a comprehensive overview of quality management and internal audit in Romanian dental practice, several contextual aspects could not be analyzed in detail due to the limited availability of published information. Specifically, reliable and up-to-date data regarding the proportion of private dental practices, the distribution of solo versus group practices, the existence and adoption of formal accreditation or quality-certification systems, and the implementation of quality-management programs at national or regional level were not consistently reported in the available literature. Consequently, these aspects remain insufficiently documented and warrant further investigation in future studies focusing on the organizational characteristics of Romanian dental services.

7. Conclusions

The absence of standardized audit frameworks, validated indicators, and data-driven monitoring systems represents a major limitation. Current practices rely on regulatory compliance rather than performance evaluation.

The integration of structured audit systems, digital monitoring tools, and targeted professional training is essential to improve clinical performance, ensure consistency, and enhance patient safety.

Within the Romanian context, the available literature and the current regulatory framework suggest that quality management activities in dental practice are primarily oriented toward compliance with statutory and professional requirements. Published Romanian evidence specifically addressing standardized audit frameworks, validated dental quality indicators, and structured internal audit procedures remains limited. Therefore, further nationwide research is needed to objectively evaluate the implementation of audit-based quality improvement strategies in Romanian dental practice. Strengthening audit culture, digital integration, and professional training may facilitate closer alignment of Romanian dental services with contemporary European quality management models.

The recommendations proposed in this review should be regarded as potential directions for strengthening quality management rather than as evidence of currently established practice within Romanian dental services.

Author Contributions: Conceptualization, I.C.L. and E.R.B.; methodology, D.G.B.; software, I.T.; validation, I.L., R.C.B. and I.L.; formal analysis, E.R.B.; investigation, I.T.; resources, I.L.; data curation, I.L.; writing—original draft preparation, E.R.B.; writing—review and editing, D.G.B.; visualization, I.C.L.; supervision, R.C.B.; project administration, I.C.L. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: No new data were created or analyzed in this study. Data sharing is not applicable to this article.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Ho, J.C.Y.; Chai, H.H.; Huang, M.Z.; Lo, E.C.M.; Chu, C.H. Impact of Modern Communication in Transforming Dental Care. *Dent. J.* **2025**, *13*, 441. [\[CrossRef\]](#)
2. Guo, Y.; Logan, H.L.; Dodd, V.J.; Muller, K.E.; Marks, J.G.; Riley, J.L., III. Health literacy: A pathway to better oral health. *Am. J. Public Health* **2014**, *104*, e85–e91. [\[CrossRef\]](#) [\[PubMed\]](#)
3. Ho, J.C.Y.; Chai, H.H.; Lo, E.C.M.; Huang, M.Z.; Chu, C.H. Strategies for effective dentist-patient communication: A Literature Review. *Patient Prefer. Adherence* **2024**, *18*, 1385–1394. [\[CrossRef\]](#) [\[PubMed\]](#)
4. Gherai, D.S.; Sabău Popa, D.C.; Rus, L.; Matica, D.E.; Mare, C. The Impact of Romanian Internal Auditors in ESG Reporting and Sustainable Development Goals. *Sustainability* **2024**, *16*, 8680. [\[CrossRef\]](#)
5. Agmon, N.; Kordova, S. Model for Global Quality Management System in System of Systems: Quality Management in System of Systems Project. *Appl. Syst. Innov.* **2025**, *8*, 3.
6. Antoniadou, M.; Sokratous, S.; Dimitriou, E.; Tzoutzas, I. Evaluating Dental Students' Knowledge and Attitudes Toward Antisepsis and Infection Control: An Educational Intervention Study at a Public University Dental Department. *Hygiene* **2025**, *5*, 24. [\[CrossRef\]](#)
7. Carmagnola, D.; Toma, M.; Henin, D.; Perrotta, M.; Pellegrini, G.; Dellavia, C. Personal Protection Equipment and Infection Control Procedures among Health Workers during the COVID-19 Pandemic. *Healthcare* **2022**, *10*, 944. [\[CrossRef\]](#) [\[PubMed\]](#)

8. Di Spirito, F.; Giordano, F.; Di Palo, M.P.; De Benedetto, G.; Aulisio, L.; Boccia, G. Sustainable Dental and Periodontal Practice: A Narrative Review on the 4R-Framework—Reduce, Reuse, Rethink, Recycle—And Waste Management Rationalization. *Dent. J.* **2025**, *13*, 392.
9. Gurupur, V.P.; Vu, G.; Mayya, V.; King, C. The Need for Standards in Evaluating the Quality of Electronic Health Records and Dental Records: A Narrative Review. *Big Data Cogn. Comput.* **2024**, *8*, 168. [[CrossRef](#)]
10. Bradács, A.I.; Voiță-Mekeres, F.; Daina, L.G.; Davidescu, L.; Hozan, C.T. Assessing Patient Satisfaction with Hospital Services: Perspectives from Bihor County Emergency Hospital, Romania. *Healthcare* **2025**, *13*, 836. [[CrossRef](#)] [[PubMed](#)]
11. Christoforidis, C.; Anastasiadou, S.D. Quality Management and Certification of Services in Assisted Reproductive Technology Units (ARTUs): A Review of Practices and Policy Proposals for Improving Patient-Centered Outcomes. *Sci* **2026**, *8*, 14. [[CrossRef](#)]
12. Cardile, D.; Corallo, F.; Cappadona, I.; Ielo, A.; Bramanti, P.; Lo Buono, V.; Ciurleo, R.; De Cola, M.C. Auditing the Audits: A Systematic Review on Different Procedures in Telemedicine. *Int. J. Environ. Res. Public Health* **2023**, *20*, 4484. [[CrossRef](#)] [[PubMed](#)]
13. Schalli, M.; Kogler, B.; Miorini, T.; Gehrer, M.; Reinthaler, F.F. High-Speed Dental Instruments: An Investigation of Protein-Contaminated Dental Handpieces with the Bicinchoninic Acid Assay in Dental Offices in Styria, Austria. *Int. J. Environ. Res. Public Health* **2023**, *20*, 1670. [[CrossRef](#)] [[PubMed](#)]
14. AlBahrani, S. Environmental Pathogen in Healthcare Settings: *Candida auris*—The Emerging Threat with a Focus on the Middle East and Infection Control Strategies. *Microbiol. Res.* **2025**, *16*, 221. [[CrossRef](#)]
15. Samara, M.N.; Harry, K.D. Leveraging Kaizen with Process Mining in Healthcare Settings: A Conceptual Framework for Data-Driven Continuous Improvement. *Healthcare* **2025**, *13*, 941. [[CrossRef](#)] [[PubMed](#)]
16. Anderková, V.; Babič, F.; Paraličová, Z.; Javorská, D. Intelligent System Using Data to Support Decision-Making. *Appl. Sci.* **2025**, *15*, 7724. [[CrossRef](#)]
17. Myers, R.; Larson, E. Compliance with hand hygiene in dental settings: A systematic review. *Am. J. Infect. Control* **2018**, *46*, 132–140.
18. Cleveland, J.L.; Gray, S.K.; Harte, J.A.; Robison, V.A.; Moorman, A.C.; Gooch, B.F. Transmission of blood-borne pathogens in US dental health care settings. *J. Am. Dent. Assoc.* **2016**, *147*, 729–738. [[CrossRef](#)] [[PubMed](#)]
19. Mutters, N.T.; Hägele, U.; Hagenfeld, D.; Hellwig, E.; Frank, U. Compliance with infection control practices in a university hospital dental clinic. *GMS Hyg. Infect. Control* **2014**, *9*, Doc18. [[PubMed](#)]
20. Erasmus, V.; Daha, T.J.; Brug, H.; Richardus, J.H.; Behrendt, M.D.; Vos, M.C.; van Beeck, E.F. Systematic review of studies on compliance with hand hygiene guidelines in hospital care. *Infect. Control Hosp. Epidemiol.* **2010**, *31*, 283–294. [[CrossRef](#)] [[PubMed](#)]
21. Allegranzi, B.; Pittet, D. Role of hand hygiene in healthcare-associated infection prevention. *J. Hosp. Infect.* **2009**, *73*, 305–315. [[CrossRef](#)] [[PubMed](#)]
22. Alkadi, L.; Farook, F.F.; Binmoghaiseeb, I.; Alyousef, Y.; Alabdulwahab, A.; Aljohani, R.; Asiri, A. Knowledge and Compliance with Infection Prevention and Control Practices in Prosthodontic Procedures Among Dental Students and Professionals. *Healthcare* **2024**, *12*, 2536. [[CrossRef](#)] [[PubMed](#)]
23. Kohn, W.G.; Collins, A.S.; Cleveland, J.L.; Harte, J.A.; Eklund, K.J.; Malvitz, D.M. Guidelines for Infection Control in Dental Health-Care Settings—2003. *MMWR Recomm. Rep.* **2003**, *52*, 1–61. [[PubMed](#)]
24. Harrel, S.K.; Molinari, J. Aerosols and splatter in dentistry: A brief review of the literature and infection control implications. *J. Am. Dent. Assoc.* **2004**, *135*, 429–437. [[PubMed](#)]
25. Estrich, C.G.; Mikkelsen, M.; Morrissey, R.; Geisinger, M.L.; Ioannidou, E.; Vujicic, M.; Araujo, M.W.B. Estimating COVID-19 prevalence and infection control practices among US dentists. *J. Am. Dent. Assoc.* **2020**, *151*, 815–824. [[CrossRef](#)] [[PubMed](#)]
26. Cagetti, M.G.; Cairoli, J.L.; Senna, A.; Campus, G. COVID-19 Outbreak in Dental Practice: A Literature Review on Preventive Measures. *Int. J. Environ. Res. Public Health* **2020**, *17*, 4609.
27. Meng, L.; Hua, F.; Bian, Z. Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. *J. Dent. Res.* **2020**, *99*, 481–487. [[CrossRef](#)] [[PubMed](#)]
28. Ather, A.; Patel, B.; Ruparel, N.B.; Diogenes, A.; Hargreaves, K.M. Coronavirus Disease 19 (COVID-19): Implications for Clinical Dental Care. *J. Endod.* **2020**, *46*, 584–595. [[CrossRef](#)] [[PubMed](#)]
29. Bida, F.C.; Agop-Forna, D.; Bulancea, B.P.; Balcoş, C.; Fornă, N.C. An Observational Study on Oral Health and Quality of Life for RPD Wearers in the N-E Region of Romania. *Medicina* **2022**, *58*, 1247. [[CrossRef](#)] [[PubMed](#)]
30. Murariu, A.; Hanganu, C.; Bobu, L.; Vasluiianu, R.; Gelet, G.; Baci, R.; Stafie, C.; Fornă, N. Comparative study of oral health systems in Europe. *Rom. J. Oral Rehabil.* **2020**, *12*, 11–17.
31. Caramida, M.; Tancu, A.; Imre, M.; Dumitrache, M.; Mihai, C.; Sfeatu, R. Patients' Perspective on Their Experience of Dental Treatments Covered by Public Health Insurance in Romania—A Pilot Study. *Int. J. Environ. Res. Public Health* **2022**, *19*, 272.
32. Potra Cicalău, G.I.; Todor, L.; Cristea, R.A.; Hodişan, R.; Marcu, O.A.; Ţig, I.A.; Daina, L.G.; Ciavoi, G. Integrated Dental Practice Management in Romania: A Cross-Sectional Case–Control Study on the Perceived Impact of Managerial Training on Efficiency, Collaboration, and Care Quality Dental. *Healthcare* **2025**, *13*, 1631. [[PubMed](#)]

33. Butnaru, O.; Tatarciuc, D.; Bida, F.C.; Balcos, C.; Constantin, V.; Cojocaru, C.; Tudorici, T.; Rotundu, G.; Sirghe, A.; Haba, D. The Accuracy of AI-Assisted Imaging Diagnosis versus Conventional Evaluation of Dental Professionals. *Med.-Surg. J.* **2025**, *129*, 236–245. [CrossRef]
34. Tibeica, S.C.; Baciuc, E.R.; Lupu, I.C.; Balcos, C.; Luchian, I.; Budala, D.G.; Tibeica, A.; Surlari, Z.; Carausu, E.M. Creating and Validating a Questionnaire for Assessing Dentists' Self-Perception on Oral Healthcare Management—A Pilot Study. *Healthcare* **2024**, *12*, 933. [PubMed]
35. Radu, C.-P.; Pana, B.C.; Pele, D.T.; Costea, R.V. Evolution of Public Health Expenditure Financed by the Romanian Social Health Insurance Scheme From 1999 to 2019. *Front. Public Health* **2021**, *9*, 795869. [CrossRef] [PubMed]
36. Marcu, A. *Metode Utilizate în Monitorizarea Stării de Sănătate*; Institutul de Sănătate Publică: București, Romania, 2002. Available online: https://insp.gov.ro/download/cnepss/metodologii_ghiduri_recomandari_si_evidente_stintifice/ghiduri_si_recomandari/Metode-utilizate-in-monitorizarea-starii-de-sanatate-publica.pdf (accessed on 5 April 2026).
37. Cernega, A.; Nicolescu, D.; Imre, M.M.; Totan, A.R.; Arsene, A.; Șerban, R.; Perpelea, A.-C.; Nedea, M.-I.; Pițuru, S.-M. Volatility, Uncertainty, Complexity, and Ambiguity (VUCA) in Healthcare. *Healthcare* **2024**, *12*, 773. [CrossRef] [PubMed]
38. Cernega, A.; Mincă, D.G.; Furtunescu, F.L.; Radu, C.-P.; Părvu, S.; Pițuru, S.-M. The Predictability of the Dental Practitioner in a Volatile Healthcare System: A 25-Year Study of Dental Care Policies in Romania (1999–2023). *Healthcare* **2025**, *13*, 249. [CrossRef] [PubMed]
39. Lamasanu, V.; Virvescu, D.I.; Luchian, I.; Rotundu, G.; Butnaru, O.-M.; Budala, D.G.; Curca, F.R.; Bida, F.C.; Balcos, C.; Surlari, Z.; et al. Development and Validation of a Questionnaire Comparing the Role of Conventional Versus Digital Technologies as an Innovating Tool in Prosthodontics. *Prosthesis* **2026**, *8*, 2.
40. Tibeica, S.C.; Virvescu, D.I.; Lupu, I.C.; Budala, D.G.; Luchian, I.; Tibeica, A.; Surlari, Z.; Carausu, E.M. Patients' Satisfaction Regarding Oral Healthcare Services in the North-East Region of Romania: A Preliminary Questionnaire Survey. *Healthcare* **2024**, *12*, 1195. [CrossRef] [PubMed]
41. Mayya, V.; Vu, G.T.; Mandhidi, B.; King, C.; Gurupur, V.; Little, B.; Singhal, A. EAT: Explainable attentive transformers for identifying the factors influencing dental visits to enhance dental data completeness. *BMC Oral Health* **2025**, *25*, 1913. [CrossRef] [PubMed]
42. Saveanu, C.I.; Meslec, M.D.; Saveanu, A.E.; Anistoroaei, D.; Bobu, L.; Balcos, C.; Tanculescu, O. Knowledge Level on Infection Control among Romanian Undergraduate and Postgraduate Dental Students. *Medicina* **2022**, *58*, 661. [CrossRef] [PubMed]
43. Saveanu, C.I.; Dărăbăneanu, G.; Bobu, L.I.; Anistoroaei, D.; Bamboi, I.; Ciortescu, I.; Saveanu, A.E. A Cross-Sectional Questionnaire-Based Survey on Blood-Borne Infection Control among Romanian Dental Students. *Medicina* **2022**, *58*, 1268. [PubMed]
44. Budianu, M.-A.; Ciurea, C.N.; Moraru, L.; Voidăzan, S. Burden of Healthcare-Associated Infections and Antimicrobial Resistance in a Romanian Cardiovascular and Transplant Center: Factors Associated with Mortality. *Antibiotics* **2025**, *14*, 926. [CrossRef] [PubMed]
45. Bida, F.C.; Curca, F.R.; Lupusoru, R.-V.; Virvescu, D.I.; Scurtu, M.; Rotundu, G.; Butnaru, O.M.; Tudorici, T.; Luchian, I.; Budala, D.G. The Systemic Link Between Oral Health and Cardiovascular Disease: Contemporary Evidence, Mechanisms, and Risk Factor Implications. *Diseases* **2025**, *13*, 354. [CrossRef] [PubMed]
46. Tatarciuc, D.; Curca, F.R.; Virvescu, D.I.; Butnaru, O.M.; Goriuc, A.; Bida, S.; Luchian, I.; Surlari, Z.; Scurtu, M.; Ursu, R.G.; et al. Alzheimer's Disease and Oral Health from Clinical Challenges to Interdisciplinary Care: A Narrative Review. *J. Clin. Med.* **2025**, *14*, 6696. [CrossRef] [PubMed]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.