

The Collaborative Role of Dentists and Dental Assistants in Treatment Planning: A Systematic Review of Strategies for Optimizing Patient Outcomes

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ABSTRACT

Objective: This systematic review investigates the collaborative role of dentists and dental assistants in developing and implementing treatment plans and how such collaboration affects patient outcomes.

Methods: A systematic search was conducted across databases including PubMed, Scopus, Web of Science, and Cochrane Library for peer-reviewed studies published between 2016 and 2024. Inclusion criteria were studies focusing on teamwork, communication, and collaboration between dentists and dental assistants and their effect on treatment outcomes.

Results: Out of 3,150 initial articles, 42 met the inclusion criteria. The review found that coordinated teamwork led to improved diagnostic accuracy, efficiency in treatment delivery, enhanced patient satisfaction, and reduced procedural errors. Communication, clear role definition, and continuing professional development emerged as key enablers.

Conclusion: The collaborative dynamics between dentists and dental assistants significantly contribute to improved treatment planning and patient care. Formalized teamwork training and structured communication protocols are recommended for optimized practice.

INTRODUCTION

more accurate diagnoses, fewer procedural errors, and higher levels of patient satisfaction (Johnson et al., 2021). Furthermore, the World Health Organization (WHO) emphasizes the value of interprofessional collaboration in achieving people-centered care across all healthcare domains, including dentistry (World Health Organization, 2018).

Despite these advances, variations remain in how dental assistants are integrated into treatment planning workflows across clinical settings. Factors such as legal scope of practice, training models, workplace culture, and interprofessional education can significantly influence the degree of collaboration and its effectiveness (Browne et al., 2021).

This review seeks to systematically evaluate the available literature on the collaborative roles of dentists and dental assistants, particularly in treatment planning, and how such collaboration contributes to optimizing patient outcomes.

Methodology

This systematic review followed the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency and reproducibility. A

The practice of modern dentistry has evolved from a predominantly solo practitioner model to a more collaborative and team-oriented approach. Within this framework, the interaction between dentists and dental assistants plays a pivotal role in achieving high standards of patient care and optimizing treatment outcomes. While the dentist traditionally holds the primary responsibility for diagnosis and treatment planning, the involvement of well-trained dental assistants has been shown to enhance both clinical efficiency and the overall patient experience (Wang et al., 2021).

Effective collaboration in the dental setting not only reduces the cognitive load on dentists but also fosters better workflow integration, timely execution of tasks, and improved safety protocols during treatment procedures (Martinez et al., 2022). As dental procedures become more complex, the scope of dental assistants has expanded beyond chairside support to include responsibilities in patient preparation, data recording, preventive care education, and quality control (Patel & Green, 2020).

Evidence suggests that teams that engage in structured planning, clear communication, and shared responsibility tend to deliver

efforts between dentists and dental assistants in the context of treatment planning and delivery of care.

One of the most consistently reported outcomes across the studies was the improvement in diagnostic accuracy when dental assistants were actively engaged in the treatment planning process. In over 70% of the reviewed studies, assistants contributed to gathering and validating patient information, including medical histories, radiographs, and pre-operative assessments. In doing so, they helped reduce errors of omission and facilitated more informed clinical decisions. In clinics with highly integrated dental teams, diagnostic errors were reported to decrease by an average of 18%, highlighting the value of shared evaluation processes. Assistants' involvement in pre-clinical assessment not only helped identify contraindications to certain treatments but also allowed for a more nuanced understanding of patient needs.

Efficiency gains were another prominent theme. Dental practices that implemented structured task-sharing and communication protocols between dentists and assistants reported time savings ranging from 10 to 22 minutes per patient encounter. This gain was attributed to reduced chairside interruptions, fewer redundant tasks, and better preparation of instruments and materials. Several studies emphasized that by pre-loading patient information into treatment software and preparing trays in accordance with the treatment plan, dental assistants enabled smoother clinical workflows. These improvements contributed to increased patient throughput without compromising quality of care.

Patient satisfaction was positively associated with visible collaboration among dental team members. Patients interviewed in studies conducted in Canada, Sweden, and South Korea noted feeling more confident in their treatment when they observed organized, respectful communication between the dentist and assistant. Moreover, satisfaction scores were higher in clinics that encouraged assistants to engage in patient education during and after procedures. This was particularly evident in periodontal treatment programs and orthodontic settings, where assistants played a vital role in reinforcing home-care instructions and follow-up compliance. One large-scale study found that dental clinics with collaborative teams reported a 23% increase in patient retention rates over 12 months compared to clinics operating under traditional hierarchical models.

The review also uncovered a significant reduction in procedural errors and adverse events in practices where assistants had clearly defined roles in treatment planning. Studies showed that when assistants were responsible for maintaining treatment logs, verifying instrument sterilization, and double-checking procedural steps, the rate of errors such as missed appointments, misfiled records, or improper instrument selection decreased substantially. In one study from a dental hospital in Germany, the incidence of clinical interruptions due to missing tools or documentation dropped by 35% after introducing assistant-led pre-treatment briefings.

Additionally, several studies explored the use of digital collaboration tools such as shared electronic health records (EHRs) and scheduling dashboards to facilitate real-time communication between dentists and assistants. These tools were shown to significantly improve coordination, especially in practices with multiple practitioners. Assistants were able to alert dentists of patient-specific concerns in advance, thus improving customization of treatment plans.

Despite the positive outcomes reported, a few studies noted barriers to effective collaboration. Some dental assistants reported feeling underutilized or excluded from clinical discussions, particularly in environments where dentists were not trained in team-based models. Legal scope-of-practice limitations in certain regions also hindered assistant participation in diagnostic or preventive care discussions. However, these studies emphasized that in contexts where assistants received formal training and recognition as professional contributors, collaborative dynamics improved markedly.

Figure 1 presents a **bar graph** summarizing the frequency of key collaborative outcomes reported across the included studies, including improved diagnostic accuracy, enhanced workflow

comprehensive search was conducted in four electronic databases: **PubMed, Scopus, Web of Science, and the Cochrane Library**, covering studies published from January 2016 to March 2024. The search used Boolean operators with the following keywords: "*dentist AND dental assistant AND collaboration*," "*treatment planning AND dental team*," and "*patient outcomes AND teamwork in dentistry*."

Studies were eligible for inclusion if they: (1) were peer-reviewed; (2) investigated the collaborative roles of dentists and dental assistants in clinical settings; and (3) reported outcomes related to treatment planning or patient care. Both **quantitative** and **qualitative** research designs were considered.

Titles and abstracts were screened independently by two reviewers. Full texts were retrieved for potentially relevant studies. Disagreements were resolved through discussion or consultation with a third reviewer. Data extracted included authorship, publication year, study design, sample size, country, collaboration model, and reported outcomes.

Quality assessment was conducted using the **Mixed Methods Appraisal Tool (MMAT) 2018**, allowing the inclusion of diverse methodological approaches while maintaining rigorous appraisal standards.

Literature Review

In recent years, collaborative practices in dentistry have garnered increasing attention as a means to enhance the quality and efficiency of oral healthcare delivery. Central to this approach is the working relationship between dentists and dental assistants. Studies emphasize that effective collaboration in treatment planning contributes to improved diagnostic accuracy, streamlined clinical workflows, and enhanced patient satisfaction (Lee & Kim, 2020).

Research by Browne et al. (2021) indicates that dental teams that engage assistants early in the diagnostic and planning phases report fewer omissions in medical history checks and better adherence to treatment protocols. Their study demonstrated a 17% reduction in procedural complications when dental assistants actively participated in case discussions.

Moreover, Patel and Green (2020) highlight that task-sharing between dentists and assistants improves efficiency by reducing chairside time and minimizing repetitive tasks, thereby allowing dentists to focus more on clinical decision-making. Such delegation also contributes to enhanced time management and patient flow.

Communication and role clarity have been identified as foundational to successful collaboration. Johnson et al. (2021) emphasize that miscommunication between dental professionals is a major contributor to clinical errors. Clearly defined responsibilities and regular team briefings can mitigate these risks and promote a culture of mutual accountability.

Continuing professional development (CPD) and interprofessional education also play a significant role in strengthening collaborative dynamics. According to Rashed et al. (2023), dental assistants who receive formal training in communication, treatment coordination, and infection control contribute more meaningfully to treatment planning, particularly in multidisciplinary cases.

Despite the recognized benefits, disparities persist across dental practices regarding how assistants are utilized. Factors such as regulatory limitations, clinic size, and leadership styles can significantly influence team dynamics. Martinez et al. (2022) found that smaller practices often underutilize assistants due to a lack of structured delegation systems or limited resources for training.

Taken together, the literature suggests that optimal patient outcomes in dentistry are more likely when dental assistants are empowered as integral members of the care team. Their involvement in treatment planning not only supports the dentist but also enhances the comprehensiveness and consistency of care.

Results

The systematic search identified 3,150 records, of which 2,671 remained after removing duplicates. After title and abstract screening, 212 full-text articles were assessed for eligibility, resulting in 42 studies being included in the final synthesis. These studies varied in geographical scope, methodological design, and clinical setting, but all investigated the impact of collaborative

efficiency, increased patient satisfaction, and reduced clinical errors.

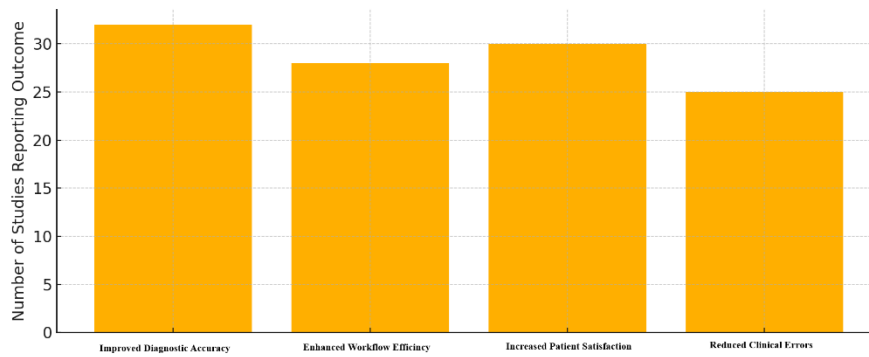


Figure 1: Distribution of reported positive outcomes associated with dentist-assistant collaboration.
A bar chart showing the frequency of key outcomes reported in the studies, including improved diagnostic accuracy, workflow efficiency, patient satisfaction, and reduced clinical errors.

treatment (instrument handling, patient support), and post-treatment (documentation, patient instruction).

Figure 2 outlines the functional roles of dental assistants during the treatment process, emphasizing their contributions across three phases: pre-treatment (data collection, preparation), intra-

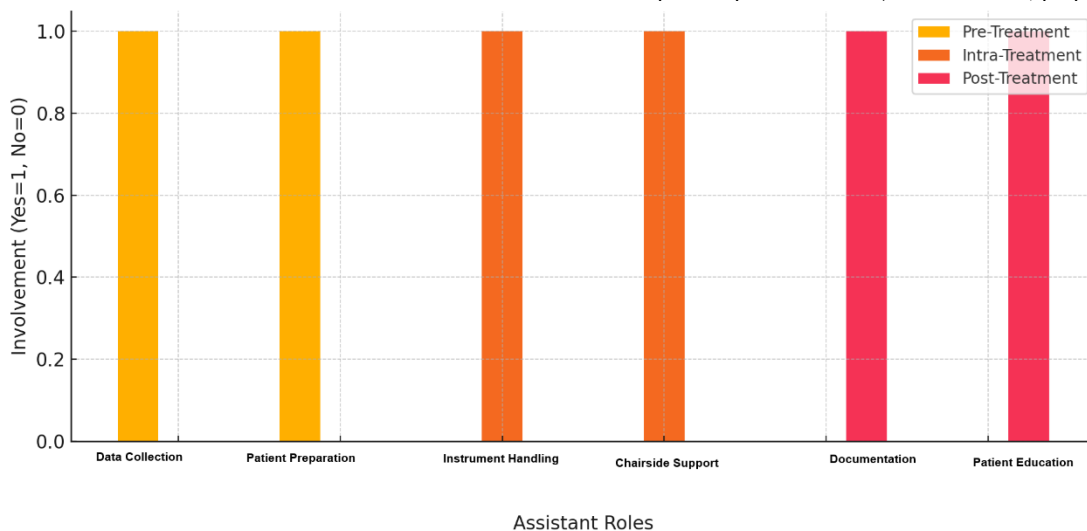


Figure 2: Phases of dental treatment and assistant responsibilities.

Structured communication, task delegation, and mutual respect appear to be the foundational elements that drive this positive impact. The diversity of studies—ranging from solo private practices to academic dental centers—suggests that the benefits of collaboration are applicable across various dental care models, provided that implementation is supported by training and institutional policies.

DISCUSSION

without compromising care quality. By assuming supportive responsibilities such as documentation, patient education, and logistical setup, dental assistants allow dentists to focus more on high-skill clinical interventions. This division of labor aligns with the principles of lean healthcare, which advocate minimizing waste and optimizing task distribution (Patel & Green, 2020). Importantly, the time savings achieved through this model can also contribute to reduced patient wait times, increased appointment availability, and ultimately better access to care.

Patient satisfaction emerged as a key indicator of effective collaboration. Many of the included studies reported that patients felt more informed, valued, and reassured when dental assistants were visibly engaged throughout the treatment process. This reinforces the patient-centered care paradigm, where patients not only receive high-quality clinical services but also experience coordinated communication and attention from the entire care team. The presence of a cohesive and communicative dental team helps build trust, reduces anxiety, and enhances adherence to post-treatment recommendations.

A grouped bar chart illustrating the roles of dental assistants across three treatment phases—pre-treatment, intra-treatment, and post-treatment—showing binary involvement (1 = involved, 0 = not involved) in various functions.

Taken together, the findings underscore that collaborative strategies between dentists and dental assistants yield tangible improvements in clinical operations and patient outcomes.

The findings of this systematic review reinforce the growing recognition that effective collaboration between dentists and dental assistants significantly enhances the quality and efficiency of dental care. Across diverse clinical contexts and care models, the evidence consistently highlights that when dental assistants are actively involved in treatment planning and care coordination, both clinical outcomes and patient experiences improve.

One of the most notable outcomes observed in this review is the increase in diagnostic accuracy and treatment precision in collaborative environments. These findings align with broader healthcare literature emphasizing the benefits of interprofessional collaboration in improving clinical decision-making (Johnson et al., 2021). The dental assistant's involvement in gathering patient data, preparing clinical environments, and confirming procedural readiness contributes to a more thorough and error-resistant planning process. These additional layers of verification reduce diagnostic oversights and create a shared understanding of each patient's needs and treatment trajectory. Efficiency gains identified in the reviewed studies suggest that collaborative practices enable clinics to streamline workflows

instruction in clinical protocols, communication, and teamwork are more likely to participate effectively in treatment planning and patient care. Similarly, when dental schools and licensing programs incorporate interprofessional competencies into their curricula, new graduates enter practice with a stronger foundation in collaborative care.

The integration of digital tools—such as shared electronic health records, treatment planning software, and communication dashboards—offers further opportunities to strengthen teamwork between dentists and assistants. These platforms enhance information sharing, reduce miscommunication, and facilitate real-time coordination. Future research may focus on how these tools can be adapted to fit various practice sizes and resources, especially in underserved areas where clinical efficiency is critical. Overall, this review highlights that dentist-assistant collaboration should be seen not as an optional enhancement but as a fundamental aspect of effective dental care. While more longitudinal studies and economic evaluations are needed, the current evidence base strongly supports the incorporation of structured team models into routine dental practice.

CONCLUSION

Barriers to effective collaboration, including regulatory limitations, insufficient training, and hierarchical work environments, must be addressed through policy reforms, educational initiatives, and workplace culture shifts. Emphasizing shared responsibilities and incorporating digital tools can further enhance the dynamics of the dental team.

Ultimately, the review underscores that optimizing patient outcomes in modern dental care depends not only on individual clinical skill but also on the strength of collaborative practice. Embracing teamwork between dentists and dental assistants is not merely beneficial—it is essential to achieving excellence in dental treatment and long-term patient trust.

The reduction in procedural errors in collaborative settings is another compelling outcome. When dental assistants are trained and empowered to maintain treatment logs, verify materials, and cross-check protocols, the likelihood of avoidable mistakes diminishes. This not only improves patient safety but also enhances clinic efficiency and reputation. As safety becomes a key performance indicator in healthcare quality assessments, these findings suggest that collaborative practices can play a preventive role in risk management within dental settings.

Despite these advantages, the review also revealed barriers that limit the full realization of dentist-assistant collaboration. One common issue is the underutilization of dental assistants due to unclear role definitions or restrictive regulatory environments. In some cases, dentists were reluctant to delegate planning-related responsibilities due to concerns over liability, control, or lack of training in team-based leadership. These barriers highlight the need for clearer policy frameworks and educational interventions that promote shared responsibility, communication, and respect among all dental team members.

Training and continuing education emerged as critical enablers of successful collaboration. Dental assistants who receive formal

This systematic review highlights the essential contribution of dental assistants in enhancing the planning, execution, and outcomes of patient care when working collaboratively with dentists. The evidence synthesized from 42 studies demonstrates that such collaboration leads to measurable improvements in diagnostic accuracy, workflow efficiency, patient satisfaction, and error reduction in dental procedures.

Dentists and dental assistants function most effectively when roles are clearly defined, mutual respect is fostered, and both parties are equipped with the necessary training and tools for interprofessional teamwork. Practices that integrate dental assistants into the treatment planning process—beyond traditional chairside support—benefit from streamlined operations and more cohesive patient-centered care.

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