The Role of Evidence-Based Dentistry in Shaping the Curriculum of Contemporary Dental Schools in the United States

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ABSTRACT

Evidence-based dentistry (EBD) integrates the best available scientific evidence with clinical expertise and patient values and has become a cornerstone of contemporary dental practice [1–3]. In the United States, evolving accreditation standards, rapid scientific advances, and increasing emphasis on accountability in health professions education have driven substantial curricular reform. This narrative review examines the role of EBD in shaping the structure, content, and pedagogy of contemporary U.S. dental school curricula. A structured literature review identified key domains in which EBD informs curriculum design, including biomedical foundations, critical appraisal skills, clinical decision-making, interprofessional education, and assessment strategies. Longitudinal integration of EBD enhances analytical thinking, supports lifelong learning, and aligns dental education with modern standards of care.

Keywords: Evidence-based dentistry; dental curriculum; dental education; critical appraisal; clinical decision-making; accreditation standards

INTRODUCTION

Dental education in the United States has undergone significant transformation in response to scientific innovation, demographic shifts, and rising expectations for quality and safety in oral health care [1,4,5]. Evidence-based dentistry (EBD) provides a systematic framework for integrating research evidence into clinical decision-making and has increasingly influenced educational priorities in dental schools.

By emphasizing critical appraisal of the literature and application of best evidence to patient care, EBD supports consistency, transparency, and accountability in clinical practice [6]. Accrediting bodies such as the Commission on Dental Accreditation (CODA) have reinforced this shift by embedding evidence-based competencies within accreditation standards, positioning EBD as a foundational curricular element [7].

Background

The concept of evidence-based practice originated in medicine and was later adapted to dentistry to address gaps between research findings and clinical application [2,8]. In dentistry, EBD is defined as the integration of systematically assessed scientific evidence with practitioner expertise and patient preferences [9]. Historically, dental curricula emphasized technical proficiency with limited formal instruction in research methodology or critical appraisal.

Contemporary curricula increasingly embed EBD longitudinally across preclinical and clinical phases, linking biomedical sciences, behavioral sciences, and clinical training. This integration supports ethical reasoning, adaptability to innovation, and lifelong learning while aligning education with competency-based models [10–12].

Methods and Search Strategy

A narrative literature review was conducted using PubMed, Scopus, ERIC, and Google Scholar to identify English-language publications from 2000 to 2025. Search terms included combinations of 'evidence-based dentistry,' 'dental education,' 'curriculum,' and 'accreditation.' Articles addressing curricular design, educational outcomes, accreditation standards, and faculty development related to EBD were included.

RESULTS

The literature identifies several curriculum domains shaped by EBD, including research literacy and biostatistics, critical appraisal skills, evidence-informed clinical decision-making, case-based learning, and competency-based assessment [13–18]. Dental schools implementing vertically integrated EBD curricula report improved student confidence in clinical reasoning and sustained engagement with scientific literature.

DISCUSSION

The findings of this review underscore the central role of evidence-based dentistry (EBD) in shaping the educational mission and curricular structure of contemporary dental schools in the United States. As dental practice becomes increasingly complex, driven by rapid scientific advancement, emerging technologies, and heightened expectations for quality and safety, the ability of graduates to critically appraise and apply evidence has become an essential professional competency [6,17,20]. The integration of EBD into dental curricula reflects a deliberate shift away from technique-driven training toward educational models that emphasize analytical reasoning, clinical judgment, and patient-centered decision-making.

Across the literature, EBD is positioned as a unifying framework connecting foundational biomedical sciences with clinical education. Longitudinal curricular models embed EBD across preclinical and clinical phases, enabling students to contextualize research findings within authentic clinical scenarios and support ethical, evidence-informed treatment planning [10–12,18]. Such integration aligns with competency-based education and CODA standards emphasizing critical thinking, professionalism, and lifelong learning [7,19].

Pedagogically, EBD has influenced the adoption of problem-based learning, case-based discussions, and small-group seminars, which foster active learning and clinical reasoning. Assessment strategies increasingly evaluate reasoning processes rather than procedural recall alone, promoting alignment between educational objectives and assessment practices [14–16,21].

Despite its benefits, challenges persist. Faculty development remains a critical barrier, as many educators were trained prior to widespread adoption of evidence-based practice. Sustainable integration of EBD requires institutional investment in faculty training, curricular coordination, and educational scholarship. Additionally, curricular overcrowding necessitates thoughtful integration to avoid fragmented or superficial inclusion of EBD principles [15,22].

Beyond technical competence, EBD fosters professional values such as ethical practice, shared decision-making, and responsiveness to patient preferences. Graduates educated within evidence-based frameworks are better prepared to adapt to evolving standards of care and contribute to quality improvement within oral health systems [20,23].

Limitations

This review is limited by its narrative design and reliance on published literature, which may underrepresent unpublished curricular innovations. Variability in terminology and outcome measures across studies limits direct comparison of educational effectiveness and long-term outcomes.

CONCLUSION

Evidence-based dentistry plays a pivotal role in shaping contemporary dental curricula in the United States by aligning educational outcomes with modern clinical practice and societal expectations. Embedding EBD across dental education enhances students' ability to critically evaluate scientific evidence, apply best practices to patient care, and engage in ethical, informed decision-making [1,6,20].

When implemented longitudinally and supported by appropriate pedagogy, EBD strengthens the integration of research, education, and clinical care while promoting lifelong learning. However, meaningful implementation requires sustained institutional commitment, faculty development, and alignment with accreditation and assessment frameworks [7,15,22].

In conclusion, evidence-based dentistry represents not merely a curricular component, but a foundational educational philosophy that shapes how future dental professionals think, learn, and practice. Continued evaluation and refinement of EBD-driven curricula are essential to preparing graduates capable of delivering high-quality, patient-centered, and ethically grounded oral health care in an increasingly evidence-driven health care environment [23].

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