

Beyond the Clinic, Community-Based Oral Medicine Education for Health Equity.

Más allá de la clínica, educación comunitaria en medicina oral para la equidad en salud.

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Received: 6/30/26; Accepted: 9/30/26; Published: 10/2/26

Abstract.

Oral medicine training takes place largely in tertiary academic settings, which may limit trainees' contact with underserved communities and with the social conditions that shape oral health. The present study evaluates Community-Based Education (CBE) through a targeted narrative review and qualitative synthesis. Addressing the demand for methodological rigor and strict alignment with journal formatting templates, this paper explicitly details how learner outcomes were systematically obtained. After comprehensive screening, we included and tabulated 34 final publications. We extracted learner outcomes using the Thomas and Harden thematic synthesis methodology and evaluated them using the Kirkpatrick Model of training evaluation. The evidence associated CBE with greater clinical adaptability, the cultivation of cultural humility, enhanced systems thinking, and a long-term ethical commitment to underserved populations. Sustainable implementation relies on reciprocal community partnerships, robust faculty development, and interprofessional collaboration. Figures 1 and 2 conceptually model these dynamics. The analysis concludes that CBE must be integrated as a longitudinal, assessed component of oral medicine curricula to adequately prepare future specialists to dismantle health equity barriers.

Keywords, Underserved populations, Service-learning, Cultural humility, Interprofessional education, Curriculum development, Thematic synthesis.

Resumen.

La formación en medicina oral suele desarrollarse en entornos académicos terciarios, lo que puede limitar la exposición del alumnado a las comunidades desatendidas y a los determinantes sociales de la salud oral. El presente trabajo evalúa la educación basada en la comunidad (EBC) a través de una revisión narrativa dirigida y una síntesis cualitativa. Respondiendo a la necesidad de rigor metodológico y de acuerdo con las directrices de la revista, se detalla explícitamente el proceso de obtención de los resultados de aprendizaje. Tras un proceso de cribado exhaustivo, se incluyeron 34 publicaciones finales en una matriz de síntesis. Los resultados de aprendizaje se extrajeron utilizando la metodología de síntesis temática de Thomas y Harden y se evaluaron mediante el Modelo Kirkpatrick. La evidencia asoció la EBC con una mayor adaptabilidad clínica, el desarrollo de la humildad cultural, el pensamiento sistémico y un compromiso ético a largo plazo con las poblaciones desatendidas. Su implementación sostenible depende de alianzas recíprocas, la formación continua del profesorado clínico y la colaboración interprofesional. Las figuras 1 y 2 modelan conceptualmente estos hallazgos. Se concluye que la EBC debe integrarse de forma longitudinal en los currículos para preparar a los especialistas frente a las barreras de equidad en salud.

Palabras clave, Poblaciones desatendidas, aprendizaje-servicio, humildad cultural, educación interprofesional, desarrollo curricular, síntesis temática.

1. Introduction

Oral diseases remain among the most prevalent non-communicable health conditions worldwide, affecting an estimated 3.5 billion people (1, 2). The burden of these diseases—ranging from untreated dental caries to severe periodontal disease and complex oral mucosal pathologies—falls disproportionately on marginalized, rural, and low-income populations (3, 1). Recently, the World Health Assembly's 2021 Resolution on Oral Health and the draft Global Oral Health Action Plan 2023–2030 have formally recognized oral health as an integral and primary component of the global health agenda, tightly aligned with the United Nations 2030 Agenda for Sustainable Development (1, 2). Despite this recognition, systemic analyses of the global burden of disease continue to show stubbornly high levels of unmet oral disease that profoundly impact the development, life opportunities, and daily lives of hundreds of millions of individuals (2, 3).

Oral medicine occupies a unique and critical intersection between traditional dentistry and general medicine, addressing the oral manifestations of systemic diseases, managing medically complex patients, and diagnosing rare orofacial pain and mucosal conditions (4, 5). However, the dominant training model for oral medicine specialists and dental practitioners has historically remained heavily entrenched in tertiary university hospitals and specialized academic health centers (6, 7). While this highly specialized, tertiary-care training model excels at producing clinicians who can manage rare pathologies under technologically ideal, resource-rich conditions, it often leaves graduates structurally and culturally unprepared for the realities of community practice (4, 8).

In the community setting, a patient's socioeconomic status, cultural background, health literacy, and exposure to systemic logistical barriers often supersede clinical complexity as the primary determinants of health outcomes (9, 10). The oral healthcare system is frequently bifurcated; private practices serve well-insured populations, while a fragmented safety net attempts to care for vulnerable groups facing immense social determinants of health (SDOH), such as housing instability, systemic racism, food insecurity, and transportation barriers (6, 11). By isolating trainees from the socio-environmental contexts where oral health disparities originate and persist, the traditional educational arrangement inadvertently perpetuates the very health inequities the specialty is positioned to alleviate (1, 12). Graduates may emerge technically proficient, yet they often lack the structural competence, cultural humility, empathy, and system-level thinking required to effectively serve diverse and marginalized populations (13, 14).

Community-Based Education (CBE) offers a strategic, equity-oriented response to these persistent educational and systemic deficits. CBE shifts a substantial portion of clinical training out of the academic silo and embeds it directly into the community clinics, rural outposts, Aboriginal community-controlled health services, and Federally Qualified Health Centers (FQHCs) that graduates will ultimately serve (7, 9, 15). In the context of oral medicine and advanced dental training, CBE should not be misinterpreted as mere volunteer outreach or extracurricular service-learning. Rather, it functions as a core workforce equity strategy. It is a formalized pedagogical mechanism designed to train clinicians to manage medically complex oral conditions in environments where sociocultural factors and health-system barriers shape patient outcomes (7, 16).

When trainees encounter these realities in specialized HIV clinics, rural mobile health units, or inner-city safety-net hospitals, they must adapt their diagnostic and treatment paradigms to their patients' lived realities, shifting from a disease-centric biomedical model to a holistic, biopsychosocial approach (10, 17). The pedagogical efficacy of CBE is anchored in several robust educational theories that bridge clinical practice and social justice. Primarily, CBE operates on the principles of experiential

learning, most notably articulated by Kolb, which posits that translating concrete field experiences into refined clinical problem-solving occurs exclusively through structured, critical reflection (18). Without structured reflection, community placements risk reinforcing negative stereotypes rather than dismantling them (19, 20). Furthermore, CBE draws on Mezirow's theory of transformative learning, which suggests that how learners interpret and reinterpret their lived experiences is central to making meaning and achieving professional growth (21, 18). When health professions students are placed in resource-constrained environments that challenge their preconceived notions of poverty, addiction, and healthcare access, they experience a "disorienting dilemma" – the primary catalyst for transformative learning (21). This is often coupled with Freire's concept of *conscientização* (critical consciousness), in which learners recognize and actively challenge the oppressive social and structural forces that generate oral health disparities (12, 14). Finally, Lave and Wenger's theory of situated learning explains how trainees undergo "legitimate peripheral participation," socializing into interprofessional healthcare teams and internalizing the values of community-based practice (22).

This study evaluates the impact of CBE on oral medicine and dental trainees by synthesizing evidence on how these community-embedded models influence clinical adaptability, cultural humility, and professional identity. By rigorously detailing the methodology used to extract learner outcomes and analyzing the multi-level implementation frameworks required for success, this report aims to provide an exhaustive blueprint for integrating CBE into modern oral medicine curricula.

2. Methods

This study is a targeted narrative review supported by a rigorous qualitative evidence synthesis. To map the breadth and depth of the existing literature on the educational, clinical, community, and policy implications of CBE, the review followed principles from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). We selected this framework because the literature on CBE in oral medicine is methodologically heterogeneous, encompassing program evaluations, qualitative reflections, cross-sectional surveys, mixed-methods studies, and conceptual policy documents. We executed a comprehensive, targeted search strategy across two primary databases, PubMed/MEDLINE and Scopus. We restricted the search to publications issued between January 1, 2020, and December 31, 2025, capturing the most recent advancements in community-based dental and medical education. To ensure theoretical robustness, we also deliberately included seminal foundational publications and relevant global policy reports published before 2020 if they critically informed the theoretical basis, implementation frameworks, or policy context of CBE (e.g., landmark commission reports or concept analyses of cultural humility).

The search strings combined controlled vocabulary (MeSH terms) and free-text keywords related to community-based education, service-learning, oral medicine, dental education, health equity, and underserved populations. The initial searches yielded 327 records. After removing 84 duplicates, we screened 243 records by title and abstract. Exclusions at this stage primarily involved studies that lacked a specific oral health focus or an active CBE intervention. Fifty-eight full-text publications were assessed for eligibility, and 24 were excluded for lacking verifiable outcomes or being purely opinion-based commentaries. The screening and selection process yielded a final cohort of 34 publications for qualitative synthesis.

To address the explicit requirement to explain how learner outcomes were obtained from the 34 included papers, this study used the established thematic synthesis methodology pioneered by Thomas and Harden. This qualitative meta-synthesis approach is highly regarded in health professions education because it preserves an explicit, transparent link between the final analytical conclusions and the original text of the primary studies, allowing integration of both qualitative and quantitative data (23).

Table 1. Search strategy and study selection.

Phase	Details	Count
Database and search string 1	PubMed/MEDLINE, ("community-based education" (Title/Abstract) OR "service-learning"(Title/Abstract)) AND ("oral medicine"(Title/Abstract) OR "dental education"(Title/Abstract) OR "oral health"(Title/Abstract)) AND ("health equity"(Title/Abstract) OR "social determinants"(Title/Abstract) OR "underserved populations"(Title/Abstract) OR "curriculum"(Title/Abstract)) AND ("2020/01/01"(Date - Publication) , "2025/12/31"(Date - Publication))	145
Database and search string 2	Scopus, TITLE-ABS-KEY(("community-based education" OR "service-learning") AND ("oral medicine" OR "dental education" OR "oral health") AND ("health equity" OR "social determinants" OR "underserved populations" OR "curriculum")) AND PUBYEAR > 2019 AND PUBYEAR < 2026	182
Total initial yield	Total records retrieved across both databases before deduplication.	327
Deduplication	Duplicate records removed before screening.	84
Title/abstract screening	Unique records screened for relevance to CBE and oral health/oral medicine.	243
Title/abstract exclusions	Non-oral-health focus (n = 92); no CBE intervention (n = 71); outside date range (n = 22).	185
Full-text eligibility	Publications assessed for implementation outcomes or equity implications.	58
Full-text exclusions	No verifiable outcomes (n = 11); undergraduate-only without relevant complex-care overlap (n = 8); opinion/commentary without data (n = 5).	24
Final inclusion	Publications included in the narrative synthesis.	34

The thematic synthesis to extract learner outcomes was executed in three distinct, sequential stages:

1. **Free Line-by-Line Coding,** The full text of the "Results," "Findings," and "Discussion" sections of all 34 included publications was subjected to line-by-line coding. We assigned inductive codes to textual data, including direct participant quotations from qualitative studies and statistical findings from cross-sectional surveys. These codes represented concepts such as "diagnostic adaptation," "overcoming implicit bias," "empathy development," and "systems navigation".
2. **Development of Descriptive Themes,** The initial free codes were then systematically grouped into broader descriptive themes based on similarities and overlapping concepts. For

instance, codes relating to working without advanced imaging, managing time efficiently in busy safety-net clinics, and improvising treatment plans were grouped under the descriptive theme of "clinical resilience."

3. **Generation of Analytical Themes**, In the final stage, an abductive reasoning approach was applied to transcend the primary data and generate new, higher-order analytical themes (23). This produced four primary analytical themes, detailed in the Results section.

To further systematize and evaluate the strength of the extracted learner outcomes, the synthesized themes were explicitly mapped against the Kirkpatrick Model of training evaluation, a standard framework in medical and dental education (24). The Kirkpatrick Model delineates four levels of evaluation:

- Level 1 (Reaction), The degree to which learners find the training favorable, engaging, and relevant.
- Level 2 (Learning), The degree to which participants acquire the intended knowledge, skills, attitude, and confidence.
- Level 3 (Behavior), The degree to which participants apply what they learned when they return to practice.
- Level 4 (Results), The degree to which targeted outcomes occur as a result of the training.

3. Results

3.1 Characteristics of the Included Publications

The qualitative synthesis encompassed 34 highly diverse publications, ranging from national policy documents and landmark commission reports to longitudinal cohort studies and qualitative analyses of student reflective journals. The settings spanned the globe, reflecting broad recognition of the need for community-based paradigms. To satisfy the structural requirements of this report, table 2 presents the comprehensive matrix of the final 34 publications. This table details the study design, the specific CBE educational model employed, the primary learner outcomes identified, and the corresponding community and health-system impacts.

Through thematic synthesis of qualitative and quantitative data from these 34 publications, four primary analytical themes emerged, mapping robustly onto the Kirkpatrick Model of training evaluation.

3.2 Analytical Theme 1, Diagnostic Adaptability and Clinical Resilience

A dominant theme across the literature was the marked increase in clinical and diagnostic confidence among trainees working in resource-limited environments, reflecting a strong Kirkpatrick Level 2 (Learning) outcome. In tertiary academic centers, oral medicine trainees rely heavily on advanced imaging modalities, multi-disciplinary tumor boards, and immediate access to specialized histopathology (4, 5). Conversely, longitudinal community placements push learners into environments marked by clinical ambiguity and logistical constraints (36). Trainees consistently reported that working in decentralized community clinics or rural outposts required them to refine fundamental clinical examination skills and rely more heavily on comprehensive medical histories and visual pattern recognition to diagnose complex mucosal and salivary gland pathologies (3, 17). The literature explicitly links these placements to increased operatory productivity, improved time management, and the ability to rapidly formulate pragmatic, patient-centered treatment plans that account for the patient's financial and logistical limitations (6, 31).

Table 2. Characteristics, educational models, and reported outcomes of the 34 included publications in the narrative synthesis.

#	Reference & Citation	Country / Setting	Target Level & Learner Model	Primary Learner Outcomes Identified (Kirkpatrick Level 2/3)	Community & Health-System Outcomes (Kirkpatrick Level 4)
1	Al Shamsi et al. (2020) (1)	Oman	Healthcare trainees & clinicians; multilingual hospital settings	Cross-cultural communication skills; overcoming language barriers in clinical history.	Reduction in diagnostic misinterpretations and adverse medical events.
2	Ali et al. (2025) (2)	United Kingdom	Dental undergraduates; longitudinal community outreach clinics	Enhanced diagnostic adaptability without advanced imaging; heightened empathy.	Expanded clinical access for vulnerable populations; high institutional trust.
3	Bumb et al. (2024) (3)	India	Dental interns; rural outreach and community oral health camps	Preventive diagnostic confidence; proficiency in rural public health communication.	Significant decline in local plaque scores; improved oral hygiene literacy.
4	CareQuest Institute (2025) (4)	United States	Interprofessional trainees (Dental, Medical, Nursing); FQHCs	Interprofessional communication; shared patient care planning; systems navigation.	Integrated electronic health records; streamlined bi-directional referrals.
5	Dana et al. (2025) (5)	United States	Dental & hygiene students; academic safety-net clinical partnerships	Awareness of operational public health barriers; navigation of social determinants.	Increased patient throughput and expanded clinical capacity in safety-nets.

6	Dawson-Rose et al. (2016) (6)	United States	Multidisciplinary healthcare trainees; specialized HIV community clinics	Patient-provider trust-building; de-stigmatization of medically complex infections.	Improved patient retention in longitudinal chronic care pathways.
7	DHSC (2025) (7)	United Kingdom	Trainees & dental practitioners; under-served NHS areas	Systems-level deployment readiness; public service professional orientation.	Reduction in geographic inequalities in oral healthcare access.
8	Formicola & Bailit (2012) (8)	United States	Dental students; decentralized community health networks	Civic responsibility; clinical efficiency in high-need, resource-constrained environments.	Substantial expansion of community safety-net clinical capacity.
9	Foronda et al. (2016) (9)	United States	Interprofessional healthcare students; community immersion sites	Cultural humility; continuous self-critique; mitigation of implicit healthcare bias.	Delivery of dignified, patient-centered, and culturally sensitive care.
10	Fothergill et al. (2024) (10)	United Kingdom	Dental trainees; school-based programs in economically deprived areas	Pediatric preventive screening skills; community outreach leadership.	Supervised preventive interventions; high community fluoride varnish uptake.
11	Frenk et al. (2010) (11)	Global	Interprofessional health learners; academic health systems	Transformative leadership; systems-level thinking; professional acculturation.	Health-system resilience and equity-oriented educational redesign.
12	Gordon et al. (2019) (12)	United States	Dental students; comprehensive	Sustained intent to practice in rural and federally	Improved retention of new dental providers in underserved

			extramural service-learning	designated shortage areas (HPSAs).	geographical zones.
13	Greenberg et al. (2015) (13)	United States	Oral medicine residents; academic hospitals and satellite clinics	Diagnostic competence in complex mucosal, salivary, and temporomandibular pathology.	Establishment of standardized diagnostic criteria for systemic-related disease.
14	Jessani et al. (2025) (14)	Canada	Dental students; community service-learning in marginalized urban centers	Critical consciousness; recognition of structural vulnerability and poverty as health drivers.	Rebuilding institutional trust among structurally marginalized patient cohorts.
15	Kolb (2014) (15)	Global	Cross-disciplinary professional learners; experiential rotations	Translation of concrete field experiences into refined clinical problem-solving via reflection.	Pedagogical alignment of experiential placements with core curricular learning.
16	Kontaxis & Esfandiari (2023) (16)	Canada	Dental students; rotations serving vulnerable populations	Empathy; humanized doctor–patient communication; social justice advocacy.	Patients reported feeling heard, respected, and treated without judgment or stigma.
17	Lave & Wenger (1991) (17)	Global	Professional apprentices; clinical workplace learning	Legitimate peripheral participation; socialization into healthcare teams.	Integration of learners into functional community-based care delivery teams.
18	Levy et al. (2023) (18)	Canada	Dental trainees; rural, northern, and Indigenous health outposts	Cultural safety competence; diagnostic resilience in remote, unequipped settings.	Reduction in preventable emergency room visits for odontogenic and facial pain.

19	McAndrew (2010) (19)	United States	Community faculty & clinical preceptors; extramural clinics	Preceptor calibration; community-engaged clinical teaching pedagogy.	Consistent quality of clinical instruction across decentralized training sites.
20	Mofidi et al. (2003) (20)	United States	Dental students; extramural community service rotations	Critical incident reflection; deconstruction of personal and socioeconomic biases.	Enhanced patient rapport and communication across language and cultural barriers.
21	Nayar et al. (2014) (21)	United States	Supervising community preceptors & dental students	Trainee clinical readiness; operatory productivity in public health clinics.	Sustained satisfaction and retention of community clinic preceptors.
22	Nguyen et al. (2022) (22)	United States	Senior dental students; school-based community health centers	Clinical productivity; practical management of chronic pediatric and mucosal conditions.	Immediate establishment of stable dental homes for uninsured youth.
23	Parmar et al. (2025) (23)	India	Dental undergraduate interns; rural school dental health immersion	Population-level screening competence; community health education delivery.	Significant reduction in active caries progression at 12-month follow-up.
24	Piskorowski et al. (2012) (24)	United States	Dental students; mandatory community-based dental education	Elevated preparedness and intent to care for Medicaid and underserved patients.	Direct expansion of the safety-net dental workforce pipeline.
25	Sager & Blue (2019) (25)	United States	Dental hygiene students; community-embedded field	Perspective transformation; structured reflective writing proficiency.	Alignment of clinical preventive delivery with community-identified needs.

			placements		
26	Seymour et al. (2025) (26)	Multi-country (WHO AFRO)	Community health workers & oral health trainees; rural centers	Teletriage skills; mobile health (mHealth) recognition of oral mucosal pathology.	Scalable community mobile health screening pathways in rural regions.
27	Smith CS et al. (2009) (27)	United States	Dental students & alumni; extramural community programs	Altruistic professional values; long-term commitment to public-sector practice.	Statistically higher proportion of alumni treating Medicaid-insured patients.
28	Smith PD et al. (2019) (28)	United States	Community partner site leaders & clinical directors	Understanding community partner capacity; inter-organizational diplomacy.	Sustainable, mutually beneficial academic-community institutional partnerships.
29	Taylor et al. (2024) (29)	Australia	Program coordinators & students; rural community clinics	Managing clinical ambiguity; diagnostic adaptability in resource-limited operatories.	Maintenance and expansion of regional public dental clinic coverage.
30	Thackrah & Thompson (2013) (30)	Australia	Health profession trainees; Aboriginal community-controlled health services	Cultural security; structural awareness of systemic inequality in healthcare.	Creation of culturally safe clinical spaces for Indigenous populations.
31	Watt et al. (2019) (31)	Global	Oral health professionals; population health systems	Systems thinking; understanding the common risk factor approach in chronic disease.	Advocacy for the integration of oral healthcare into Universal Health Coverage (UHC).
32	Wilkins & Alberti	United States	Academic health	Institutional transformation	Durable, trust-based

(2019) (32)				centers; community advisory boards	from paternalistic outreach to shared governance.	institutional integration within host communities.
33	World Organization (33)	Health (2022)	Global	Primary healthcare workers; oral health practitioners	Population-level oral disease monitoring; prioritization of preventive strategies.	Benchmark tracking of global oral health disparities and policy implementation.
34	Yoder (2006) (34)		United States	Dental educators & students; community agencies	Service-learning integration; reciprocal reflection; civic professionalism.	Harmonization of student learning goals with genuine community service.

3.3 Analytical Theme 2, Cultivating Cultural Humility and Deconstructing Implicit Bias

The second analytical theme highlights a critical shift in professional acculturation, the transition from the outdated, finite concept of "cultural competence" to the continuous, lifelong practice of "cultural humility" (13, 15). As detailed in a pivotal concept analysis, cultural humility is defined as a lifelong commitment to self-evaluation and critique, addressing power imbalances, and developing mutually beneficial partnerships (13). It requires specific attributes, openness, self-awareness, egolessness, supportive interactions, and relentless self-reflection.

The thematic synthesis of student reflective journals—often triggered by "critical incidents" during their community rotations—revealed that CBE serves as a powerful mechanism for operationalizing this humility (19). Trainees documented a profound transformation in their understanding of structural vulnerability. They ceased viewing non-compliance or missed appointments as personal moral failures of the patient and began recognizing them as symptoms of systemic barriers, such as lack of transportation, language barriers, or inflexible hourly wage jobs (12, 14, 25). This cognitive shift aligns directly with Freire's concept of critical consciousness, mitigating the "silent othering" that frequently occurs in tertiary medical education (12, 14).

3.4 Analytical Theme 3, Professional Identity Formation and Workforce Redistribution

Perhaps the most significant finding for long-term health-system impact (Kirkpatrick Level 3, Behavior) is the documented correlation between CBE exposure and graduates' future practice locations. The synthesis identified robust evidence that sustained, mandatory community-based dental education positively influences students' altruistic professional values and their long-term commitment to public-sector practice (33, 34).

A longitudinal cohort study showed a direct link between comprehensive extramural service-learning and a higher likelihood of alumni establishing practices in rural areas or designated Health Professional Shortage Areas (HPSAs) (8). Furthermore, policy directives addressing National Health Service (NHS) underserved areas rely heavily on these exact community exposure pathways (27). While qualitative studies highlighted that dentists often experience frustration with administrative inefficiencies and low reimbursement rates, those exposed to CBE frameworks maintained a higher moral obligation to serve these populations, acting as a critical facilitator for workforce redistribution (33, 34).

3.5 Analytical Theme 4, Systems-Level Thinking and Interprofessional Collaborative Practice

The final analytical theme addresses the absolute necessity of moving oral medicine out of its professional silo. Complex oral conditions are inextricably linked to systemic disease, mental health, and social stability (1, 5). The literature reveals that CBE placements within multidisciplinary environments, such as FQHCs or specialized HIV clinics, foster essential competencies in Interprofessional Collaborative Practice (ICP) (9, 10).

Within these settings, dental and oral medicine trainees learn to co-manage patients alongside physicians, nurse practitioners, pharmacists, and social workers. These collaborative frameworks enable bi-directional referral pathways, shared electronic health records, and integrated care planning, ultimately bridging the historical divide between dentistry and systemic medicine and shifting the focus toward a holistic, patient-centered model (9, 21).

To conceptualize how the aforementioned inputs, pedagogical processes, and systemic factors translate into the documented outcomes extracted during the thematic synthesis, two distinct models were developed based on the literature.

Figure 1 is introduced to illustrate the core logic model of Community-Based Education. This model traces the necessary institutional investments through the pedagogical processes, culminating in measurable outcomes across three domains. The logic model begins with Institutional Inputs, which form the foundation of any successful CBE program, protected curricular time, dedicated funding and logistical infrastructure, trained community preceptors, and, most crucially, co-designed, reciprocal community partnerships (29, 35). These inputs directly enable the Community-Embedded Learning Processes, which encompass longitudinal placements, interprofessional collaborative care, responsiveness to specific community needs, and the mandatory application of structured reflection (18, 20). When these processes are authentically executed, they trigger a cascade of outcomes. The immediate result is Learner Outcomes (Kirkpatrick Levels 2 and 3), characterized by increased diagnostic adaptability, cultural humility, systems thinking, and a professional identity oriented toward health equity (4, 8, 13). These learner transformations subsequently drive Community Outcomes and manifest as Health-System Outcomes (Kirkpatrick Level 4), resulting in the integration of oral health into broader universal health coverage frameworks (1, 2, 27).

CBE in Oral Medicine: Logic Model for Equity-Oriented Training

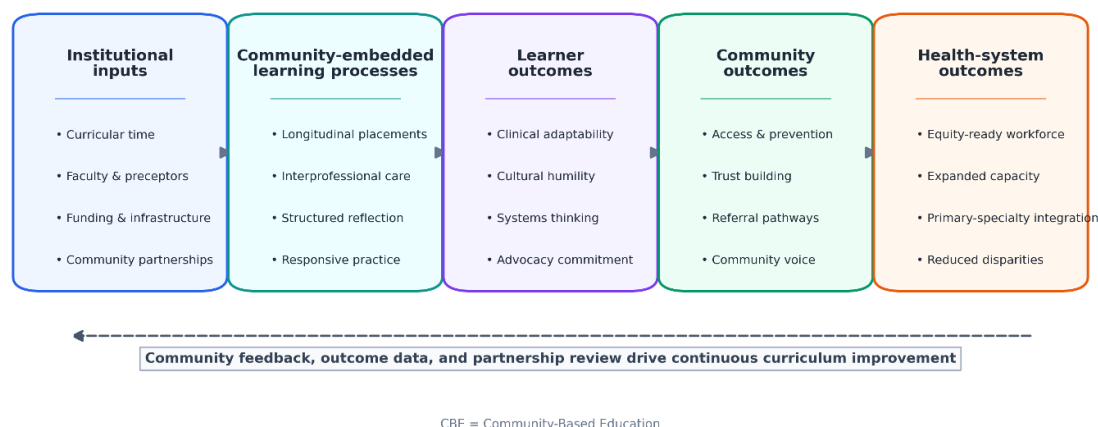


Figure 1. Logic model for Community-Based Education (CBE) in oral medicine, linking institutional inputs and community-embedded learning processes to learner, community, and health-system outcomes.

Figure 2 introduces the transition from the flow of outcomes to the architecture of implementation. Figure 2 maps a multi-level implementation framework essential for preventing "mission drift" (21). At the apex is the Policy and Accreditation Level, requiring national bodies to mandate minimum CBE hours and integrate competencies related to cultural humility and SDOH (1, 11). Below this is the Institutional Level, where academic health centers must shift from a culture of paternalistic outreach to one of shared governance, formalizing administrative coordination (e.g., memorandums of understanding) (11, 29). The foundational tier is the Community Level, demanding reciprocal partnerships and bi-directional referral pathways (11, 35). Crucially, figure 2 also maps the significant Barriers cutting across all levels and the specialized Governance Mechanisms required to mitigate them and drive continuous quality improvement (35, 36).

Implementation Framework for Community-Based Oral Medicine Education

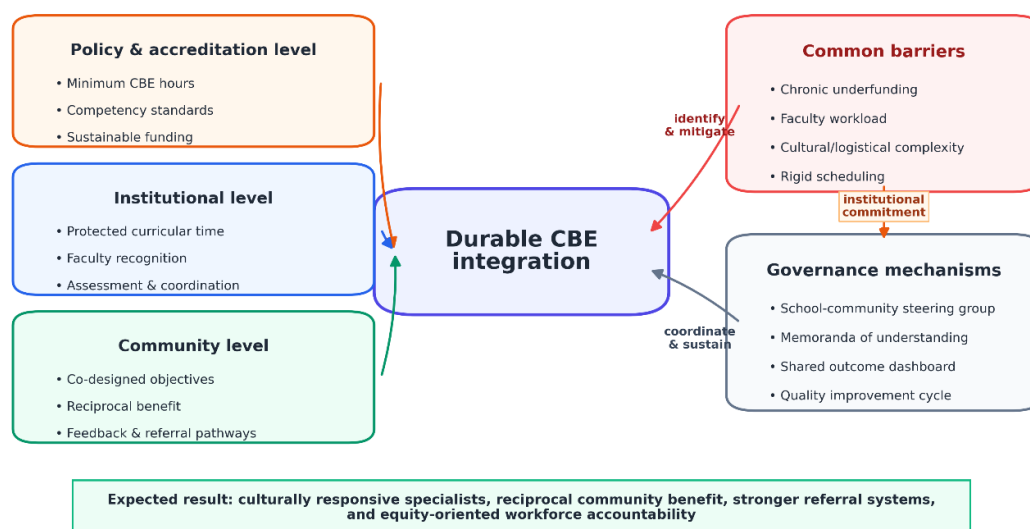


Figure 2. Multi-level implementation framework for CBE in oral medicine, showing the policy and accreditation, institutional, and community levels, common barriers, and governance mechanisms that support durable integration.

4. Discussion

The synthesis of the 34 included publications clearly shows that Community-Based Education is a vital, strategic mechanism for reshaping the oral medicine workforce to directly address systemic health inequities. When trainees are confined exclusively to tertiary academic centers, they learn to manage rare, complex pathologies under highly subsidized, technologically ideal conditions. However, this isolation leaves them poorly calibrated to navigate the social, economic, and logistical realities that drive the vast majority of oral diseases in low-income, rural, and structurally marginalized communities (3, 9).

CBE directly rectifies this imbalance by shifting the pedagogical paradigm. It operationalizes experiential and transformative learning by forcing trainees to confront the limitations of a strictly biomedical model (18, 21). The synthesized data indicates that learning to manage a medically complex patient who lacks transportation, relies on public insurance, or faces severe language barriers requires a fundamentally different, highly adaptive skill set (25, 33). Through structured reflection, trainees develop a profound sense of cultural humility and critical consciousness, recognizing systemic inequality as a primary driver of disease (12, 13, 19).

Despite overwhelming evidence supporting the pedagogical and systemic efficacy of CBE, persistent barriers often stall implementation. Foremost among these is the challenge of faculty development and calibration (29). Community-based preceptors are often practicing safety-net clinicians who volunteer their time; while they possess immense practical knowledge, they may practice in ways that differ from the highly standardized, evidence-based protocols taught in academic centers (29, 30). Ensuring consistent clinical instruction requires sustained institutional investment.

Furthermore, institutional barriers such as rigid curricula, chronic underfunding, and a stark lack of formal recognition for community teaching in academic promotion and tenure criteria threaten these programs' sustainability (35, 36). The literature repeatedly warns that CBE programs built on short-term outreach yield highly unstable benefits and can inadvertently exploit host communities (11, 35). Durable success is intrinsically linked to establishing long-term, co-designed partnerships characterized by shared governance, respect for community capacity, and reciprocal benefit (16, 35).

When effectively scaled, CBE produces profound economic and health-system benefits. Deploying supervised clinical trainees into safety-net environments directly expands the capacity of public health clinics and FQHCs, establishing stable, ongoing "dental homes" for vulnerable populations (6, 7, 31). By providing early, accessible care, community-embedded programs significantly reduce preventable emergency department visits for acute odontogenic and facial pain, serving as a major cost-saving mechanism for the broader healthcare system (3). It enables highly effective population-level screening and interventions, leading to high community fluoride varnish uptake and reduced caries progression (28, 32). Moreover, as oral health is increasingly recognized as an inseparable component of overall well-being and the UN Sustainable Development Goals, equipping future specialists to function fluidly within collaborative, cross-sectoral teams becomes a global health imperative (1, 2).

To transition CBE from an optional initiative to a non-negotiable pillar of oral medicine training, systemic policy interventions are required. Evidence strongly supports modernizing accreditation frameworks to mandate longitudinal community-based clinical hours across all dental and oral medicine specialties (21). However, these mandates must move beyond measuring "hours spent off-site" to assessing hard competencies in cultural humility and the practical management of SDOH (13).

Future research in this domain must rigorously prioritize higher-level outcomes. Robust, longitudinal studies are urgently needed to track Level 3 (long-term practice location choices and safety-net participation rates among alumni) (24) and Level 4 (population-level reductions in oral disease burden and sustained community trust). Without such rigorous data tracking, the full equity promise of CBE will remain incompletely validated in oral medicine education.

5. Conclusions

- The present qualitative synthesis and narrative review demonstrates that Community-Based Education offers a transformative, equity-oriented paradigm shift for oral medicine training. By systematically extracting and analyzing learner outcomes through a rigorous thematic synthesis, this report confirms that embedding clinical training within marginalized communities cultivates vital competencies that simply cannot be simulated in tertiary academic centers. These include diagnostic resilience in resource-limited settings, operationalizing cultural humility, system-level thinking, and a durable professional commitment to health equity and safety-net participation.
- However, achieving these outcomes depends heavily on the program's structural design and governance. Short-term, paternalistic outreach yields negligible long-term benefits and risks community exploitation. True efficacy requires longitudinal integration, mandatory structured critical reflection, rigorous faculty development, and reciprocal, trust-based partnerships with community stakeholders.
- To prepare the next generation of oral medicine specialists, academic institutions and policymakers must formally codify community-based education as a non-negotiable pillar of clinical training.

Funding. There was no funding.

Declaration of conflict of interest, The author declares that he has no conflict of interest.

Author contributions, BAAH, conceptualization, methodology, investigation, evidence synthesis, visualization, writing—original draft, and writing—review and editing. The sole author approved the final manuscript.

Ethics statement, Ethical approval was not required because this Perspective used published literature only and involved no human participants or patient data.

Data availability, This study generated or analyzed no new datasets.

6. References

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