

Influence of Community-Based Dental Education on Practice Choice: Preliminary Data from East Carolina University

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Maldistribution of the dental workforce contributes to poor access to oral health care. Community-based dental education (CBDE) may help to address this problem by using experiential learning to encourage new dentists to practice in underserved areas. The East Carolina University School of Dental Medicine (East Carolina University SoDM) employs a multifaceted strategy, including CBDE, to increase the number of dentists practicing in underserved areas of North Carolina. The aim of this study was to assess the influence of CBDE and other factors on practice choice among East Carolina University SoDM graduates. This cross-sectional study assessed practice intentions before and after a senior-year CBDE experience. Data were obtained for students in three graduating years from written student reflections and self-reported practice plans solicited at graduation. Of the total 156 students between 2015 and 2017 (52 each year), all students participated in at least one component of this evaluation: all students (100%) completed required student reflections, and 148 (95%) provided pre-graduation practice plans. Data were also obtained on alumni practice characteristics via a survey of recent graduates; 72 alumni (46% response rate) participated in the alumni survey. The assessments found positive attitudes towards the CBDE program before and after participation, although areas for improvement relating to business management and financial viability were reported. The majority of alumni respondents (67%) remained in the state to practice after graduation, with half reporting practicing in rural areas. For most alumni respondents (>75%), debt, salary, benefits, type of patient population, and desire to own/run a business were important factors other than the CBDE program influencing their practice choice. Nearly half of them (45.8%) rated desire to work in a public health setting as an important factor. This study provides preliminary data on the influence of CBDE on practice choice and opportunities in underserved settings.¹²⁻¹⁷

Although one goal of CBDE is to encourage students to practice in underserved settings, results of studies examining the impact of CBDE on intended practice choice have been mixed. Some studies have shown a measurable effect of CBDE on practice plans and awareness or intent to care for vulnerable or underserved populations.¹⁸⁻²⁷ In contrast, others have

(e.g., debt) on practice choice.²⁸⁻³² Further, one study reported that students' intended practice choice did not always accurately predict subsequent behavior.³³ Together, these reports raise the question of whether CBDE is an effective strategy for improving dental workforce distribution.³

This question has particular relevance for the East Carolina University School of Dental Medicine (East Carolina University SoDM), a dental school developed in response to a critical lack of access to oral health care for the population of North Carolina.^{34,35} North Carolina has one of the lowest dentist-to-population ratios in the nation,^{36,37} and the majority of counties in the state are considered Dental Health Professional Shortage Areas (DHPSAs).^{38,39} As part of its mission, the East Carolina University SoDM employs a multifaceted strategy modeled on that used by the East Carolina University School of Medicine⁴⁰ to encourage its students to practice in North Carolina after graduation. This strategy focuses on admissions/recruitment, scholarships, and didactic and experiential CBDE.^{35,41} In addition, the low tuition at the East Carolina University SoDM versus other dental schools, enabled by a grant from the U.S. Health Resources and Services Administration (HRSA), helps to attract students whose priorities align with the school's mission. The specific goal of this broad strategy is to increase the number of dentists practicing in North Carolina DHPSAs.

For the East Carolina University School of Medicine, these strategies have led to a measurable impact on physician distribution in North Carolina. In 2016, 81.8% of its graduates intended to practice in North Carolina after completing their medical training; the percentages of graduates planning to work primarily in underserved and rural areas were higher than those for other U.S. medical schools (32.3% and 5.1% versus 23.1% and 1.1%, respectively).⁴⁰ Furthermore, the percentage of East Carolina University School of Medicine 2016 graduates planning to work in a large city was lower than that for other U.S. medical schools (11.9% versus 38.6%, respectively).

The CBDE arm of the strategy for the School of Dental Medicine requires all students to participate in three eight-week rotations at Community Service-Learning Centers (CSLCs) during their senior year. The CSLCs are East Carolina University SoDM clinics located across North Carolina, with seven of the eight CSLCs located in counties designated as a DHPSA.^{38,42} When possible, at least one of a student's CSLC rotations is located in a county near that

student's hometown. Like the overarching strategy as a whole, the intent of the CBDE experience is to encourage students to practice in underserved areas in North Carolina after graduation and thus improve the state's dentist-to-population ratio.

Although anecdotal reports indicate that some graduates are engaging in a "mission-aligned" form of practice,⁴³ the distribution of East Carolina University SoDM graduates' practice choices remain to be documented. Therefore, the aim of this study was to assess the influence of CBDE and other factors on practice choice among East Carolina University SoDM graduates.

Methods

This study was approved by the East Carolina University and Medical Center Institutional Review Board (Protocol UMCIRB #16-000779: Community Service-Learning and Its Impact on Graduates' Future Practice Choices and Care for the Underserved). This cross-sectional study assessed pre- and post-graduation practice intentions and attitudes towards CBDE and care for populations that are underserved. Data were obtained from three sources: 1) written student reflections from a required course in the East Carolina University SoDM curriculum, 2) self-reported practice plans solicited at graduation, and 3) practice characteristics reported via an alumni survey. The first source reflects attitudes before the CBDE experience, the second reflects plans after the CBDE experience but before entry into practice, and the third reflects activities after entry into practice. The study's target population included all graduates of the East Carolina University SoDM from the first graduating class in 2015 through 2017.

All students at the East Carolina University SoDM participate in the Community Oral Health Practice (COHP) course intended as preparatory for community-based practice upon graduation. The course spans all four years of the curriculum (Table 1). During the spring semester of their junior year prior to their senior rotations, students in the COHP course are asked to reflect upon the motivational statements from their dental school applications, in which they had explained their motivation for becoming a dentist. Students were prompted to answer specific questions relating to how their motivations had changed since admission; the prompts were designed to elicit a broad range of responses relating to student attitudes toward practice intent, the CBDE

experience, and the East Carolina University SoDM mission to enhance access to oral health care across the state. Students considered any motivational changes and documented these reflections in written form within three months prior to engaging in any required community-based clinic rotations. We examined the written reflections to identify common themes before the CBDE experience.

Self-reported practice plans were solicited from senior East Carolina University SoDM students at the

the East Carolina University SoDM CBDE experience; and factors (other than CBDE) influencing practice choice (e.g., geographic location and type of practice). Opinions of the CBDE experience and factors influencing practice choice were also assessed.

We reviewed student reflections to identify recurring themes related to practice intent before exposure to extramural dental education. For the self-reported pre-graduation practice plans and alumni surveys, frequencies and distributions were used to summarize survey responses, as appropriate. For the factors influencing practice choice, ratings of important/very important and unimportant/not a factor were combined into overall categories of “important” and “unimportant,” respectively

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time of graduation (Table 3). Among these students, the most frequent plans were private practice (49%) and residency (47%). Consistent with the East Carolina University SoDM mission, almost three-quarters of the students (72%) planned to practice in North Carolina after graduation. Approximately one-third (32%) planned to practice in rural areas after graduation, with most of such students (34 of 48) being from rural hometowns. Practice plans were similar across the graduation classes.

Alumni practice characteristics were assessed with the alumni survey and were generally consistent with the graduating seniors' reported practice plans (Table 3). All alumni respondents currently were in either a private practice (50%) or residency (50%). Similarly, consistent with the reported practice plans, two-thirds of alumni respondents (67%) practiced in North Carolina at the time of the survey, and half (50%) practiced in rural counties. With the exception of wide variation in rural practice rates (from zero to 75%), practice characteristics were similar across the graduation classes.

Consistent with the mission of the East Carolina University SoDM to recruit students with a strong

sense of civic responsibility and commitment to community service, all alumni respondents reported having engaged in post-graduation volunteerism (including providing dental care) in the past year (Table 2). Similarly, a large majority of alumni respondents (75% to 100% across graduating classes) had provided oral health education in a volunteer capacity.

Attitudes About CBDE

Attitudes regarding the CBDE experience were assessed twice during the study: once before starting the CBDE experience, and once after entry into practice. Pre-rotation attitudes about the CBDE experience were assessed via student reflections completed as part of the assigned coursework. Because these written reflections were a required component of the curriculum, all students in the target population participated in this component of the study. Selected representative statements are shown in Table 4. Overall, the reflections confirmed that students entered the CBDE experience with high expectations consistent with their motivations for applying to dental school. Most students remained very oriented to the

East Carolina University SoDM mission of enhancing access to oral health care across the state and showed positive attitudes about the CSLC rotations. However, a minority of students expressed apprehension about the rotations by, for example, expressing

Given the increasing focus on the burden of student debt,⁴⁶ we further examined whether year of graduation affected the reported influence of debt on practice choice. At least three-quarters of alumni respondents (75%) in subgroups based on year of graduation rated debt as an important influence on their practice choice (Table 6). Given the small sample size available to date, effects of other demographic variables on the influence of debt on practice choice were not assessed.

Discussion

These preliminary results provide insight into the influence of the CBDE portion of the curriculum on our graduates' practice choices proximal to graduation and provide a benchmark for future comparisons of practice patterns. Consistent with the East Carolina University SoDM mission to provide access to oral health care in the state, our findings showed

that the majority of our graduates planned to and do practice in North Carolina, with a substantial proportion of them practicing in rural areas. Combined with positive student and alumni assessments of the CBDE program, these data support the effectiveness of one component of East Carolina University SoDM's educational model in influencing the distribution of new dentists in North Carolina.

Two major findings of our study—the high in-state retention and rural practice rates—are best

suggests that CBDE programs, particularly those of extended duration, may provide a feasible method for increasing the number of dentists practicing in dentally underserved areas. Nevertheless, given the small sample size of our study and thus relatively low percentage of our graduates planning to or actually working in community-based positions, additional data are needed to determine the practical effects of our CBDE program on the care of individuals from underserved populations.

In contrast, findings from three other studies do not completely affirm our results.²⁸⁻³⁰

Student attitudes were assessed through non-blinded student reflections in the East Carolina University SoDM curriculum; thus, the responses may have been positively biased or failed to reflect the full breadth of student concerns regarding the CBDE experience. Similarly, although the survey was blinded, its anonymous structure did not permit thorough validation of the reported attitudes. Given the consistency of the student and survey data regarding the CBDE experience, however, it is unlikely that either of these methodological factors meaningfully affected the interpretation of our results.

Finally, because of our educational model and study design, we were not able to isolate the specific impact of CBDE versus other education-related factors (e.g., admission/recruitment strategies, non-CBDE didactic methods) on practice characteristics. Future studies pooling data across multiple institutions will be needed to assess the relative contributions of these factors.

Building on this research, we plan to conduct longer term studies assessing practice characteristics and factors influencing practice choice for greater numbers of East Carolina University SoDM graduates, to validate our results with rigorous approaches for tracking and evaluating practice outcomes, and to benchmark our outcomes against those reported nationally in the annual senior survey conducted by the American Dental Education Association (ADEA).¹ Longitudinal analyses of student practice plans assessed at early or late times during dental training and realized alumni practice characteristics will also be informative for assessing patterns relating to practice choice, as will analyses of student characteristics that predict subsequent interest in a rural or public health career and analyses of the effect of debt amount on practice choice. Finally, national studies pooling data across institutions with similarly structured CBDE programs and admission strategies will assess the relationship between educational model and practice patterns. Documenting improved oral health in the state by a variety of measures will be the ultimate evidence of the impact of this educational model.

Conclusion

This article documents for the first time the preliminary practice choices of dentists graduating from the East Carolina University SoDM. We demonstrated that the majority of graduates planned to and do practice in the state of North Carolina after

graduation, with a substantial proportion practicing in
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