Supervising Dentists’ Perspectives on the Effectiveness of Community-Based Dental Education


Abstract: The Commission on Dental Accreditation recently implemented new predoctoral standards that require dental schools in the United States to provide students with community-based dental education (CBDE) experiences. The objective of this study was to examine the perspectives of supervising dentists (also known as dental preceptors) at rural CBDE sites regarding the University of Nebraska Medical Center program’s effectiveness in improving the competencies of dental students. Surveys were sent to all forty-three preceptors in two subsequent years: nineteen responded to all questions in 2012 and sixteen in 2013, for a total of thirty-five participants. These preceptors evaluated the effectiveness of the program based on the American Dental Education Association (ADEA) Competencies for the New General Dentist. Overall, these preceptors rated the CBDE program as effective (excellent or very good) in improving the students’ competence in five of the six ADEA domains: Critical Thinking, Professionalism, Communication and Interpersonal Skills, Health Promotion, Patient Care: Assessment, Diagnosis, and Treatment Planning, and Patient Care: Establishment and Maintenance of Oral Health. Practice Management and Informatics was found to be the least effective domain of competence. CBDE provides a unique opportunity to develop a competent dental workforce with an appreciation for the value of community service. Applying a competency-based framework to program evaluation can provide valuable information on program effectiveness to program administrators, educators, and the dental preceptors.

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Community-based dental education (CBDE) was first introduced approximately forty years ago.¹ Virtually all U.S. dental schools now incorporate some form of CBDE, especially since the Commission on Dental Accreditation (CODA) recently implemented new predoctoral standards for CBDE. The new standards not only require dental schools to provide students with community-based learning experiences but also regard CBDE as a means to develop a competent oral health workforce.²

To fulfill their CBDE requirement, dental students generally spend several days or weeks during their senior year working at off-site dental clinics or private dental offices. The dental clinics may be located in Federally Qualified Health Centers (FQHCs), Indian Health Service (IHS) facilities, Department of Veterans Affairs (VA) facilities, and local health departments, as well as private practice dental offices. Student oversight is usually provided by a supervising dentist or dentists who live and work in the local community. This is a different training model from the traditional clinical education model in which students practice in a patient care clinic owned and operated by their dental school. The traditional model generally does not provide students with the opportunity to work in an efficiently run delivery system. Moreover, traditional clinical education is more focused on teaching than delivery of high-quality care to patients.¹ In CBDE, the supervising dentists, also known as dental preceptors, provide guidance and support for the students. The preceptors, who see patients while they oversee students, grade the students on level of competence demonstrated during the CBDE experience.

A competent dental student is one who has the ability to begin independent, unsupervised dental practice. According to the American Dental Education Association (ADEA) Competencies for the New General Dentist, competence includes knowledge, experience, critical thinking and problem-solving...
skills, professionalism, ethical values, and technical and procedural skills. When students are competent, these components are integrated into one cohesive and comprehensive approach to patient care. Competence assumes that quality patient care is provided and the dentist can self-evaluate treatment effectiveness.

Previously, many aspects of CBDE experiences have been studied, including site selection, clinical productivity, financing, and student satisfaction. To date, however, no study has evaluated preceptors’ assessment of a CBDE program’s effectiveness based on the ADEA Competencies for the New General Dentist. In this study, we examined the preceptors’ perceptions regarding the overall effectiveness of a rural CBDE program in improving students’ level of competence based on the six domains of the ADEA competencies.

**Methods**

Since 1990, fourth-year dental students at the University of Nebraska Medical Center (UNMC) College of Dentistry have been participating in a required CBDE program. Prior to that time the program was voluntary. Over the last twenty-three years, the CBDE program has evolved from a one-week rotation to two three-week rotations. In 2013, the rotations were expanded from two two-week rotations to two three-week rotations. One three-week rotation must be completed in a rural private practice, and the other three-week rotation must be completed in a public health, VA, or IHS clinic. Students can start their rotations after completing their junior year, and they have until graduation to complete them (a period of about nine months). The UNMC College of Dentistry has a contract to train a limited number of Wyoming students and has an informal agreement with South Dakota for a few students. The rotation sites are assigned so that students provide care in clinics/practices in their home states.

In this study, we conducted a competency-based evaluation of the CBDE program’s effectiveness as perceived by the dental preceptors. An electronic survey was sent to all forty-three dental preceptors who were assigned students and were actively involved in the college’s CBDE program in May 2012. This sample included all preceptors participating in the program. In 2013, the survey was repeated.

The design of the survey instrument was guided by a synthesis of the literature review and our adaptation of the ADEA Competencies for the New Dentist. The ADEA competencies consist of six primary domains: Critical Thinking, Professionalism, Communication and Interpersonal Skills, Health Promotion, Practice Management and Informatics, and Patient Care in two areas: Assessment, Diagnosis, and Treatment Planning, and Establishment and Maintenance of Oral Health. The questionnaire included closed and open-ended questions on the preceptor’s gender and practice information, perceptions about the program’s effectiveness in improving the students’ competence (in the six domains), and format of the program. The preceptors were provided with a description of the ADEA competency domains as a reference. The study was granted exempt status by the university’s Institutional Review Board.

The closed-ended survey responses were descriptively summarized using SPSS 20.0. The open-ended survey responses were open-coded for emerging themes and content. The preceptors were asked to rate the CBDE program’s effectiveness in improving the students’ competence in the six ADEA competency domains on a rating scale with options of 1=excellent, 2=very good, 3=good, 4=fair, and 5=poor. The preceptors were also asked to rate the format of the program and overall success of the program on the same scale.

**Results**

Thirty of the forty-three (69.8 percent) dental preceptors responded to the electronic survey in 2012. Of these respondents, twenty-three (76.7 percent) were male, and seven (23.3 percent) were female. Half of the respondents (fifteen) worked in a solo practice, nine (30 percent) in a group practice, and the remaining six (20 percent) in other practice settings. These other settings were listed as community health centers, public health offices, and local health departments. The length of work experience the respondents had in dental practice ranged from three to forty-six years. The survey was repeated in 2013, and sixteen preceptors responded. Of the thirty preceptors who responded to the electronic survey in 2012, only nineteen (63.3 percent) answered all of the items in the questionnaire; sixteen preceptors responded and answered all questions in 2013.

The majority of the respondents in both years (combined number of thirty-four or thirty-five) rated the program’s effectiveness as excellent or very good: Critical Thinking, twenty-eight (80 percent);
The majority (twenty-nine, 82.8 percent) of the total respondents rated the format of the program as excellent or very good. The majority (thirty, 85.7 percent) also rated the program’s overall success as excellent or very good. The survey included three open-ended questions eliciting information on the respondents’ perceptions of the most and least effective components of the program for students and their suggestions for program improvement. The most effective components of the program according to the preceptors were the opportunities for students to be exposed to a wide range of clinical settings (at the community health centers, VA hospitals, or private dental clinics) and to interact with a diverse group of patients from various cultural and socioeconomic backgrounds and medically compromised patients. Other benefits of the program the preceptors named included the “one on one exchange of ideas with the student” and the “real world” experience for students in “Getting away from the dental school clinic and exposing them to a busy practice” where they are “assessing, informing, doing multiple procedures, checking hygiene, running the business, and relating with staff and the patients.” The “free clinics” were also considered to be most beneficial for the students because the clinics provide more time for the students to treat patients.

Table 1. Participating preceptors’ ratings of program effectiveness in categories of the ADEA Competencies for the New General Dentist, by number and percentage of responses in each domain for 2012 and 2013

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<tr>
<td>Critical Thinking</td>
<td>4 (21.1%)</td>
<td>5 (31.3%)</td>
<td>11 (57.9%)</td>
<td>8 (50.0%)</td>
<td>3 (15.8%)</td>
<td>3 (18.8%)</td>
<td>1 (5.3%)</td>
<td>0 (0.0%)</td>
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<td>19 (10.6%)</td>
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<td>Professionalism</td>
<td>9 (50.0%)</td>
<td>8 (50.0%)</td>
<td>6 (33.3%)</td>
<td>7 (43.8%)</td>
<td>3 (16.7%)</td>
<td>1 (6.3%)</td>
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<td>Communication and Interpersonal Skills</td>
<td>5 (27.7%)</td>
<td>6 (37.5%)</td>
<td>9 (50.0%)</td>
<td>9 (56.3%)</td>
<td>3 (16.6%)</td>
<td>1 (6.3%)</td>
<td>1 (5.5%)</td>
<td>0 (0.0%)</td>
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<td>18 (10.6%)</td>
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<td>Health Promotion</td>
<td>9 (50.0%)</td>
<td>6 (37.5%)</td>
<td>5 (27.4%)</td>
<td>7 (43.8%)</td>
<td>4 (22.2%)</td>
<td>3 (18.8%)</td>
<td>0 (0.0%)</td>
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<td>0 (0.0%)</td>
<td>18 (10.6%)</td>
<td>16 (9.4%)</td>
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<td>Practice Management and Informatics</td>
<td>0 (0.0%)</td>
<td>2 (12.5%)</td>
<td>6 (33.3%)</td>
<td>6 (37.5%)</td>
<td>9 (50.0%)</td>
<td>8 (48.8%)</td>
<td>3 (18.8%)</td>
<td>0 (0.0%)</td>
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<td>0 (0.0%)</td>
<td>18 (10.6%)</td>
<td>16 (9.4%)</td>
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<tr>
<td>Patient Care: Assessment, Diagnosis, and Treatment Planning</td>
<td>6 (33.3%)</td>
<td>7 (43.8%)</td>
<td>8 (44.4%)</td>
<td>7 (43.8%)</td>
<td>4 (22.2%)</td>
<td>2 (12.5%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
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<td>0 (0.0%)</td>
<td>18 (10.6%)</td>
<td>16 (9.4%)</td>
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<tr>
<td>Patient Care: Establishment and Maintenance of Oral Health</td>
<td>9 (50.0%)</td>
<td>5 (31.3%)</td>
<td>6 (33.3%)</td>
<td>9 (56.3%)</td>
<td>2 (11.1%)</td>
<td>2 (12.5%)</td>
<td>1 (5.5%)</td>
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Note: For full description of competency domains, see American Dental Education Association. ADEA competencies for the new general dentist. J Dent Educ 2013;77(7):899-902. Percentages may not total 100% because of rounding.
patients from different cultures and socioeconomic backgrounds.” Other least effective aspects of the program were diagnosis and treatment planning of emergency dental issues such as toothaches, dental/facial abscesses, fractured teeth due to trauma, and surgical experience, as well as endodontic experience, orthodontics, and time management. The preceptors also expressed concern about placing students in a situation in which they are doing only Medicaid service for other dentists.

These preceptors had several suggestions to improve administration of the program. These included the following: giving them additional background information about the students prior to their arriving at the rotation site; providing access to student evaluations of the placement sites to determine whether “we are meeting their needs as students”; and administering some sort of “personality evaluation” to reduce the possibilities of a poor rotation. In addition, valuable suggestions were provided with regard to improving the program’s format and content, including training students for rural and community/public health care settings, training on cultural issues, training students to be enthusiastic about practicing dentistry in these locations, extending the duration of the rotations by a week or two longer, and providing more experience in endodontic surgery. Preceptors also suggested utilizing CBDE as a program that will place students in a setting or region similar to where they may want to practice in the future. The preceptors also underscored the need to “Keep striving to uphold the highest standards in clinical care and communication techniques with patients, staff, and colleagues.”

**Discussion**

This study examined the preceptors’ perceptions regarding the effectiveness of a rural CBDE program based upon the six competencies required of new dentists. Regarding the competencies for which students had the most experience—Health Promotion, Patient Care, and Professionalism (pertaining to courses completed by students prior to going out on rotation)—most preceptors (30 percent to 50 percent) rated the CBDE training experience as excellent for the students. Conversely, for the competency domain of Practice Management, most of the preceptors had relatively lower ratings of the student training experience. This was perhaps due to the fact that the students had the least experience in this domain since relevant courses are presented in the senior year, after most students have completed their rotations. The competency domains of Critical Thinking and Communication and Interpersonal Skills were rated as very good by more than half of the preceptors. It is significant to note that the preceptors perceived the domains of Critical Thinking, Practice Management, and Communication and Interpersonal Skills as least effective when compared to the other three domains.

The domain of Practice Management appears to play a significant role in program satisfaction, and this is a curriculum design issue. With the heavy load of clinical coursework in the third year, changing the timing of the practice management courses in the curriculum is not currently an option. However, making preceptors aware of these curriculum design issues surrounding practice management and offering to, with their help, develop a tutorial for students that covers their major concerns could improve the students’ educational experience and the preceptors’ satisfaction and ratings of program effectiveness.

A discussion of the Communication and Interpersonal Skills concerns should include various chair-side behavior expectations of students in various practice environments. The dental school environment in general tends to be less patient-centered and more education-centered, while the private practice environment focuses more on patient needs and comfort. Working with the preceptors to develop ways to help students transition from an academic environment to a practice environment may help the students’ communication skills, as perceived by the preceptors. The Critical Thinking domain also needs further exploration. Starting with a common definition of critical thinking with agreed-upon examples of good and poor critical thinking may help identify where critical thinking deficiencies exist.

The study had several limitations such as the small sample size and low response rates from dental preceptors. Since the online survey was conducted using SurveyMonkey, we were unable to identify nonrespondents in order to explore the reasons for a lack of response. Further, the small sample size of less than twenty in each year does not allow us to make any meaningful statistical analyses associating preceptor characteristics with their ratings of the program. Due to the small sample size, it was also not possible to statistically test for any differences in responses between the two years. However, in spite of the inability to perform tests for statistical significance, the responses across years give an
overall picture of program effectiveness. The study has limited generalizability, given that this study was conducted in one dental school. The findings from this study may not universally apply to all CBDE programs, but it can and will be used to continue to enhance this specific program. Although the program at UNMC had been ongoing for two decades, this was the first attempt at systematically evaluating its effectiveness using a competency framework. The findings have provided actionable intelligence to the program administrators with meaningful feedback from the preceptors on ways to further improve the program experience for students and preceptors.

In spite of the described limitations and challenges in evaluating the program, the study clearly demonstrates the importance of applying a competency-based framework to evaluate program effectiveness. Evaluations of training programs in medicine, nursing, health administration, and public health have recently emphasized competency-based evaluations that provide evidence of program effectiveness in improving trainee competencies. In our review of the dental education literature, the emphasis on competency-based models of evaluation of training programs is limited. This study thus contributes to the dental education literature by applying a competency-based framework to an evaluation of the effectiveness of a CBDE program. The study provides preliminary findings from a two-year evaluation of the ongoing CBDE program at the UNMC College of Dentistry.

The open-ended survey responses also provided critical information to program administrators in ongoing program improvement efforts by providing insights into what worked well from the perspectives of the preceptors. The findings of the evaluation were disseminated to the dental students and preceptors, and the feedback obtained indicated the value of seeing what some called the “hard evidence” or “real data” on continuing program improvement. Therefore, we recommend that CBDE programs incorporate a competency-based framework as an integral component of their program formative and outcome evaluation plans. In addition, regular communication with program participants including trainees and preceptors will likely yield results in terms of a higher participation rate in evaluation surveys. Although busy dental practitioners may perceive responding to surveys as a burden, providing them with the evidence by disseminating the evaluation findings can serve to motivate participation in program evaluation and improvement. There may be survey respondent fatigue, due to surveying essentially the same group of preceptors every year. Future evaluation efforts will consider other options to obtain qualitative data on program satisfaction and effectiveness, such as conducting focus groups with preceptors and students during the annual program orientation sessions. Program evaluation albeit challenging needs to be an ongoing and iterative process with rigorous attempts to accurately measure program outcomes and actual student competence beyond student self-ratings and preceptor perceptions. To the best of our knowledge, this is the first study to have applied the ADEA competency-based framework to evaluation of a CBDE program.

Although rural upbringing and rural training programs, such as the CBDE program described in this study, are critically important factors in determining subsequent rural location of practice, it is possible that they may not be sufficient in encouraging newly graduated dental practitioners to choose rural locations of practice, which are often underserved areas. A recent study found that rural upbringing was only a minor factor in the decision to practice in a rural location. Well-crafted incentives similar to the National Health Service Corps and loan repayment programs should be considered as policy options to facilitate the choice of rural locations of practice among newly graduated dentists.

**Conclusion**

Overall, the UNMC rural CBDE program was rated by the dental preceptors as being effective in improving the competence of dental students in all six of the ADEA domains. The preceptors particularly recognized the “real world” experiences that are the unique feature of CBDE as being valuable to the students. The preceptors recommended that students spend additional time in rural practice settings as well as experience additional practice models outside of the dental school setting including different business and management training styles. CBDE provides a unique opportunity to evaluate dental student competence, while developing a culturally competent future dental workforce with an appreciation for the value of community service. Applying a competency-based framework to program evaluation can provide valuable information on program effectiveness to program administrators, educators, and the dental preceptors.
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REFERENCES