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Self Perceived Clinical Competencies and Proficiencies of Internationally Trained Dentists at a Non-US Site Completing an Advanced Education in General Dentistry Residency

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Abstract

The aim of this study was primarily to assess the self- perceived clinical competencies and proficiencies of a group of residents, enrolled in an AEGD at an international site during the resident year. The results of a 48- item self- administered online survey, which was completed at three different time intervals, were analyzed. The survey included 41 competency questions and 7 proficiency questions that were rated on a six- point scale: 1(inadequate), 2 (adequate), 3 (good), 4 (very good), 5 (excellent) and 6 (not observed). For each question a one- way analysis of variance was employed to compare the item means from month 1 to 7 to 12 for statistical significance. Additionally post-hoc tests were employed to analyze at what time period differences in perceived competency and proficiency occurred. Statistically significant differences were obtained for 13 of the 47 items. These included statements on: acting as the patient's comprehensive oral provider, treatment planning, history taking, diagnostic abilities, treatment planning, risk assessment, record keeping, medical and dental referral, working with applied personnel, management of pathologic occlusion, restoration of root treated teeth and endodontic management of anterior teeth. In terms of self perceived competence and proficiency it appears that the residents completing an AEGD benefited from the year of additional training post- graduation.

Introduction

The School of Dentistry of The University of the West Indies (SoD-UWI) developed a one- year internship program in 1994, following the graduation of the first cohort of dental students. This intensive additional year (a sixth year of training), focused primarily on reinforcing clinical experiences gained during clinical training and introduction of more advanced clinical skills. The initial program used the premise of fulfilling clinical quotas in order to achieve clinical competencies and proficiencies, as was the norm in earlier dental curricula [1].

In 1999 curricula changes were made to the undergraduate and internship program. Gaining clinical experiences were achieved through a competency- based modality by the management of patient centered complex comprehensive patient cases [2,3].

Additionally it evolved from primarily clinical training to include training in aspects of ethical issues, life skills, patient and practice management, and critical evaluation of literature and research methods.

Interns rotate through various 10-12 week clinical assignments; such as pediatric dentistry, adult dental care, community based care and oral and maxillo-facial clinics. Each clinical assignment provides different practical skills outcomes however the mainstay of the clinical year is the preparation of the graduate to function as a patient's primary and comprehensive oral care provider in a private practice setting.

In 2007, in collaboration with the Department of Dental Medicine at the Lutheran Medical Center of Brooklyn an Advanced Education in General Dentistry (AEGD) residency program was instituted at the School of Dentistry for this post graduation year. All the residents enrolled in this program were graduates of the SoD-UWI.

Similar to the internship the residency focused on training the graduate to function as the patient's primary oral health care provider by means of competency based management of complex adult cases. Management of such cases occurs within the existing clinical framework of rotating through various clinical assignments. In addition to the clinical requirements of achieving clinical competency, a requirement of this program was attendance in didactic sessions, in all aspects of dentistry and practice management, delivered via video teleconferencing (VTC) and completion of web based clinical productivity reporting and assessments involving the program and self perceived clinical competencies and proficiencies.

The aim of this study was primarily to assess the self- perceived clinical competencies and proficiencies of a group of residents enrolled in the AEGD at the UWI site during the resident year at three different time intervals.

Materials and Methods

The results of an online based, 48- item survey, developed by dental educators of the Lutheran Medical Center to evaluate self- perceived competence and proficiency of clinical skills and abilities were utilized for this assessment. No separate ethical approvals were obtained prior to administration of the surveys since the completed surveys formed part of the general reporting requirements of the AEGD program. The survey is normally administered at the start of the program and during the seventh month of the program. For the residents at the UWI site the survey was re-deployed at the end of month 12. During the orientation phase of the residency, prior to the first self -assessment, the concepts of competency versus proficiency were introduced and discussed with

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Competency/Proficiency Survey Items
1.Function as a patient's primary and comprehensive, oral health care provider as part of an interdisciplinary health care team to provide emergency and multidisciplinary comprehensive oral health care to all patients icluding those with special needs
2.Explain and discuss with patients, or parents or guardians of patients, findings, diagnoses, treatment options, realistic treatment expectations, patient responsibilities, time requirements, sequence of treatment, estimated fees and payment responsibilities in order to establish a therapeutic alliance between the patient and care provider
3.Integrate multiple disciplines into an individualized, comprehensive, sequenced treatment plan using diagnostic and prognostic information for patients with complex needs.
4.Perform dental consultations and request medical consultations for outpatients in assigned health care settings.
5. Participation in the management of a system for continuous quality improvement in a dental practice
6. Provide and manage patient-focused care that is coordinated by the general practitioner efficiently and effectively in a dental practice setting
7. Support the program's mission statement by acting in a manner to maximize patient satisfaction in a dental practice
8. Use and implement accepted sterilization, disinfections, universal precautions and occupational hazard prevention procedures in the practice of dentistry
9. Provide patient care by working effectively with allied dental personnel, including performing sit down, four handed dentistry
10.Practice and promote ethical principles in the practice of dentistry and in relationships with patients, personnel, and colleagues
11. Select and use assessment techniques to arrive at a differential, provisional and definitive diagnosis for patients
12. Obtain and interpret the patients chief complaint, medical, dental, and social history, and review of systems
13. Obtain and interpret clinical and radiographic data and additional diagnostic information from other health care providers or other diagnostic resources
14. Use the services of clinical, medical, and pathology laboratories and refer to other health professionals for the utilization of these services
15. Perform a limited history and physical evaluation and collect other data in order to establish a risk assessment for dental treatment and use that risk assessment in the development of a dental treatment plan
16. Maintain a patient record system that facilitates the retrieval and analysis of the process and outcomes of patient treatment
17. Assess, diagnose and plan for multidisciplinary oral health care for a wide variety of patients including patients with special needs
18. Inform patients of alternative treatment options available and/or risk of potential complications prior to performing invasive, surgical and/or high risk dental procedures that will allow patients to determine risk vs. benefit for the proposed treatment and arrive at a decision towards treatment
19. Obtain and/or document written approval from patients to perform those specific dental procedures requiring consent
20. Direct health promotion and disease prevention activities.
21. Use accepted prevention strategies such as oral hygiene instruction, nutritional education, and pharmacologic intervention to help patients maintain and improve their oral and systemic health
22. Diagnose and manage oral mucosal lesions and oral manifestations of systemic disease
23. Diagnose and manage disorders of occlusion and temporomandibular joint
24. Diagnose and manage orofacial pain.
25. Diagnose and manage medical emergencies
26. Provide control of pain and anxiety in the conscious patient through the use of non- psychological interventions local anesthesia and/or conscious sedation
27. Prevent recognize and manage complications related to use and interactions of drugs local anesthesia and/or conscious sedation
28. Restore individual, vital teeth using a wide range of materials and methods that will enhance patient's esthetics and/or function
29. Restore endodontically treated teeth
30. Treat patients with missing teeth requiring removable appliances
31. Treat patients with missing teeth requiring uncomplicated fixed restorations
32. Manage patients requiring complicated fixed restorations including implants
33. Communicate case design with laboratory technicians and evaluate the resultant prostheses.
34. Diagnose and treat early and moderate periodontal disease using appropriate therapies and procedures
35. Manage advanced periodontal disease
36. Evaluate the results of periodontal treatment and establish and monitor a periodontal maintenance program
37. Diagnose and treat pain of pulpal origin.
38.Perform uncomplicated non-surgical anterior Endodontic therapy
39. Perform uncomplicated non-surgical posterior Endodontic therapy
40. Treat non-complex Endodontic complications.
41. Manage complex Endodontic complications.
42. Perform uncomplicated intra oral surgical procedures, including surgical extraction of teeth
43. Perform non surgical extraction of teeth.
44. Treat patients with intra-oral dental pain and infections
45. Treat patients with non-complex, post-operative complications to dental treatment.
46. Manage patients with complex, post-operative complications to dental treatment
47.Anticipate, diagnose and provide initial treatment and follow-up management for medical emergencies that may occur during dental treatment
48. Treat intraoral hard and soft tissue lesions of traumatic origin

Table 1: Complete list of administered survey items.

the residents. Survey respondents used a six -point scale with the following key: 1(inadequate), 2 (adequate), 3 (good), 4 (very good), 5 (excellent) and 6 (not observed) to rate their competency on various items. Individual items on the survey are grouped to identify learning outcomes loosely into clinical skills associated with (i) treatment planning and provision of comprehensive multidisciplinary oral health care (ii) health care delivery (iii) patient assessment and diagnosis (iv) informed consent (iv) promoting oral and general health (vi) sedation, pain and anxiety control (viii) restoration of teeth (ix) periodontal therapy (x) pulpal and periradicular therapy (xi) hard and soft tissue surgery and (xii) management of medical and dental emergences. A complete list of the administered survey items can be seen in Table 1.

Competency/Proficiency Survey Items	Mean Response 1st Month	Mean Response 2nd Month	Mean Response 3rd Month	p-value
Function as a patient's primary and comprehensive, oral health care provider as part of an interdisciplinary health care team	3.12	3.62	3.75	0.002
Integrate multiple disciplines into an individualized, comprehensive, sequenced treatment plan using diagnostic and prognostic information for patients with complex needs.	3.38	4.00	4.00	<0.001
Provide patient care by working effectively with allied dental personnel, including performing sit down, four handed dentistry	2.38	3.88	4.00	0.001
Select and use assessment techniques to arrive at a differential, provisional and definitive diagnosis for patients	3.38	4.12	4.12	0.020
Obtain and interpret the patients chief complaint, medical, dental, and social history, and review of systems	3.88	4.75	4.50	0.013
Use the services of clinical, medical, and pathology laboratories and refer to other health professionals for the utilization of these services	3.25	4.25	4.25	0.024
Perform a limited history and physical evaluation and collect other data in order to establish a risk assessment for dental treatment and use that risk assessment in the development of a dental treatment plan	3.38	4.25	4.25	0.035
Maintain a patient record system that facilitates the retrieval and analysis of the process and outcomes of patient treatment.	3.12	4.12	3.88	0.028
Inform patients of alternative treatment options available and/or risk of potential complications prior to performing invasive, surgical and/or high risk dental procedures that will allow patients to determine risk vs. benefit for the proposed treatment and arrive at a decision towards treatment	3.38	4.00	4.00	0.041
Diagnose and manage disorders of occlusion and temporomandibular joint	2.25	2.88	3.00	0.040
Restore endodontically treated teeth	3.62	4.25	4.38	0.041
Perform uncomplicated non-surgical anterior Endodontic therapy	3.75	4.62	4.50	0.016
Perform non surgical extraction of teeth.	3.12	4.38	4.50	0.001
Treat patients with intra-oral dental pain and infections	2.75	3.88	4.00	0.001

Table 2: Statistically significant items and means at different evaluation periods.

For each question a one- way analysis of variance at the 0.05 level of significance was employed to compare the item means from months 1, 7 and 12 for statistical significance. Post-hoc Bonferroni tests were employed to analyze at what time period differences in perceived competency and proficiency occurred. For statistical analysis "not observed" responses were grouped with inadequate responses.

Results

The responses of a single cohort of dental residents for the year 2008/2009 were utilized. There were a total of 8 residents in this year, 2 males and 6 females. The mean age for the group was 25.3 years. There was a 100% response rate for all three- evaluation periods. Statistical analysis revealed there were significant differences in self -perceived competency and proficiency with certain items. Additionally post hoc statistical analysis confirmed that all the differences noted occurred between the 1st and 7th month of training. Significant items together with their means and level of significance can be seen in Table 2.

Discussion

The AEGD at the University of the West Indies Site (UWI) is the first accredited AEGD program outside of the continental United States of America. Even though the AEGD is unique in that it was merged with an existing program catering to the postgraduate educational needs of newly trained graduate dentists, the tenets of a more traditional AEGD were maintained. The focus of AEGD programs is training of dentists for the practice of general dentistry [4]

Also unique to this program is the fact that the cadres of residents from year to year are all students of the UWI dental school, which allows not only evaluation during the residency year but also immediately following graduation. This can be a useful tool for examining strengths and weaknesses in the teaching curriculum of the school.

The UWI AEGD involves rotation through various clinics however the mainstay of the clinical year is the management of complex cases in the adult general dentistry clinic. Whilst on various rotations the resident is given the opportunity to treat patients in the aforementioned clinic. The only exception to this general rule is a 10-12 week block rotation through oral surgery where there is no opportunity to perform general dentistry and the clinical environment more closely resembles that of General Practice Residency (GPR) program.

Items 1,3,9,11,14,15,16,18,23,29,38,43,44 on the survey all produced statistically significant differences.

The core principles of the AEGD program are working to function as the patient's comprehensive oral provider, working within a multidisciplinary team and seeking referral, either medical or dental, when needed. Items 1 and 3 deal with these concepts especially since the training site is within the walls of a dental teaching hospital where specialists are available for easy consultation. Furthermore the dental hospital is situated within a larger regional hospital where medical consultations and referrals are easily accommodated.

Item 9 deals with working with auxiliary dental personnel, such as dental assistants. This is a direct result of the dental assistants being made available to residents during this training year. American Dental Association requirements state the AEDG residents must have dental assistant support at least 90% of the time. Statistical differences would be noted since undergraduate dental students have very limited dental assistant support, which is the norm with most dental schools [5]. Early in the AEGD year training is organized to introduce the concepts of four-handed dentistry and give residents the opportunity to effectively work with dental surgery assistants throughout the year.

Item 16, involves maintenance of patient records. Differences would be expected since as part of the training program regular chart auditing occurs. Either faculty or other residents audit patient's notes. The 4 to 6 times a year patient's charts are audited imparts the residents with useful information of how to write progress notes in order to easily retrieve information and assess the outcomes of various management modalities.

As the resident progresses through the program, the clinical experiences gained from management of more complex cases, compared to undergraduate clinical teaching cases would make the individual

more versed in selection of assessment techniques, communicating risk versus benefit of various procedures, patient referral and presenting treatment alternatives to the dental patient. Items 11,14,15 and 18 evidence this, where there were significant differences between month 1 and month 7.

The teaching of the management of pathologic occlusal problems is somewhat deficient in the undergraduate teaching curricula of the dental school [6]. Didactic sessions dealing with the clinical management of such patients are extensively covered in the AEGD teaching curriculum and the resident is given the opportunity to fabricate and deliver at least one full coverage hard occlusal splint.

Surprisingly Items 29 and 38 produced statistically significant differences between months 1 and 7. These items dealt with the restoration of endodontically treated teeth and root canal treatment of anterior teeth respectively. This could be attributed to the types of patients seen at this particular site. Even though undergraduate students are exposed to a wide variety of endodontic procedures, these are of the more complex type. As a dental student, the first endodontic experience may be that of multi-rooted teeth. Residents, however, must manage several single rooted teeth, with their subsequent final restoration as part of their clinical requirements.

Items 43, 44 deal with simple extractions and treatment of patients with intra-oral dental pain and infections. There were statistical differences between month 1 and 7. This may be due in part to the experiences gained during the intensive oral surgery rotation where not only dentoalveolar surgeries are performed routinely, but simple biopsies, surgical management of head and neck pathology and major trauma cases.

Competency and proficiency are entwined concepts. Competency is the behavior required of a beginner practitioner, which involves understanding, skill and values in an integrated manner to deal with the wide range of scenarios in the clinical practice setting. While competency involves some degree of speed consistent with patient comfort and satisfaction, performance is not expected to be of the highest level [7]. Proficiency, however, involves slightly greater speed, improved accuracy of performance, the ability to handle more complicated problems, greater internalization and integration of professional standards [7].

Whilst the majority of the items on the survey, are listed as competency items the residents at the end of the year of additional training are expected to be approaching proficiency in a wide range of clinical procedures since minimum requirements of clinical procedures must be completed as part of the certificate requirements.

Evaluation of self perceived competency as a guide to assess the effectiveness of the teaching curricula has been used previously. Indeed this has been employed to assess newer versus old curricula at the UWI School of Dentistry [6]. This present study however was administered close to graduation, which it is argued, sometimes gives a truer representation of self perceived competency as a result of dental school training compared to surveys deployed when dental graduates have spent time in practice and are more confident of their abilities [8].

Attainment of competence and proficiency is a developmental process. Self perception and evaluation is intiutive and subliminal and themselves developmental processes [9]. When considering clinical dental training educators should take into consideration resident development in the areas of: patient and procedural care, knowledge, practice based learning, interpersonal and communication skills and professionalism [10]. Progression from competence to proficiency to expertise of dental residents involves personal immersion, involvement and engagement in all areas of training. Caution must be applied; when utilizing such surveys repeated over a specific time period; that residents have not just become better at self- evaluation as they progress through the program. The results of such surveys may be correlated with other forms of assessment such as faculty evaluations or other outcome measurements to give a clearer representation of the resident's overall progress.

The results of the initial assessment of self perceived competency and proficiency in a small cohort of residents, such as this, may be utilized to develop resident specific clinical training, supervision requirements and documentation of progress. Subsequently re-deployment of such surveys throughout the period of training, as with the residency program, would give reliable and current information regarding the adequacy and shortcomings of the didactic and clinical curriculum.

The major limitation of this study was the small sample size. The sample size could have affected the power of the statistical analysis and the results of statistically relevant differences from months 7 to 12. We intend to repeat statistical analysis between the survey periods for successive groups of AEGD residents at the UWI site and compare such results with other LMC AEGD program sites within the continental United States.

Conclusion

In terms of self perceived competence and proficiency it appears that the residents completing an AEGD benefited from the year of additional training post- graduation.

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