Past, Present, and Future of Predoctoral Dental Education in Orofacial Pain and TMDs: A Call for Interprofessional Education


Abstract: Over the past several decades, there has been an explosion of knowledge in the fields of science and technology as they relate to the profession of dentistry. Due to these advances, dental curricula have had to incorporate many changes as they prepare students as well as faculty members for the twenty-first century. Dental educators have been encouraged to alter their paradigms to these new realities. One of the areas in which change has been profound is the field of orofacial pain (OFP) and, more specifically, temporomandibular disorders (TMDs). OFP/TMDs, once subject matters surrounded by ambiguity and controversy, are now being better understood due to advances in basic and clinical science research. In order to appreciate the impact that evidence-based science has had on the education of predoctoral students during past decades, it would be beneficial for dental educators to be cognizant of the history and current status regarding these topics. To promote the educational process of OFP/TMDs, a future directions approach is presented encompassing the concepts of interprofessional education so that innovation may be considered within our academic dental institutions.

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Keywords: orofacial pain, temporomandibular disorders, dental education, interprofessional education, interdisciplinary education, faculty development, oral pain management

Submitted for publication 3/7/12; accepted 6/19/12

The complexities and challenges of dental education have escalated significantly over the past several decades as a result of tremendous advances within the domains of science and technology. This development greatly influences dental curricula as the amount and depth of understanding required due to these advances are profound. Among the many important areas in which predoctoral dental students should acquire knowledge and skill and show competence is the field of orofacial pain (OFP; consisting of a broad array of conditions affecting the oral and facial regions) and, specifically, temporomandibular disorders (TMDs). However, the subject matter of OFP/TMDs may still be surrounded by ambiguity and controversy despite the fact that both basic and clinical science researchers have reached some degree of consensus with regard to multifaceted etiologies, diagnoses, and management. The ongoing controversy associated with this subject may generate confusion for the student/new graduate and may result in compromised diagnostic accuracy with resulting misdirected or incomplete care. The aims of this article are to address this problem by providing dental educators with a review of the history of and insights into the current status of education in OFP/TMDs. A suggested approach concerning the direction in which the educational process should be moving is also presented, so that change may be instituted for the benefit of predoctoral students and their patient care.

The Past: Historical Perspectives

In a 1973 article, Greene1 reported the results of a survey of forty-five dental schools (with a response rate of around 90 percent) in the United States and Canada. TMDs (formerly referred to as TMJ for temporomandibular joint) were divided into organic (pathologic) and functional categories. These subjects were being taught together in the same courses at twenty-two schools, while sixteen schools separated them. There were forty-six different course titles under which this teaching occurred, with only three schools including the term “TMJ” in the title.
The organic TMJ topics were presented most often in oral pathology and oral surgery courses, while the functional topics were discussed in oral surgery, oral diagnosis, occlusion, and periodontal courses. Only five schools had created separate courses for covering these topics, while thirty schools had created occlusion courses that featured TMJ topics. Of the twenty-two schools that had created behavioral science courses, only six covered TMJ topics within those courses. Greene concluded that, overall, most teaching was very fragmented with few courses primarily devoted to the topic of TMJ. He also found that this subject was mainly being taught as a component of occlusion courses, with minor teaching being performed as a component of behavioral science courses. The results from this study indicated that predoctoral dental education regarding TMJ was rather lacking, inconsistent, and disjointed.

In 1982, the American Dental Association convened its president’s conference on the examination, diagnosis, and management of TMDs. This was the first attempt by organized dentistry to develop definitive guidelines regarding this topic. One of the conclusions promoted by this conference was that there should be a scientific basis for establishing a treatment modality and testing for its efficacy. It would seem reasonable that this mandate be transferred to the educational process involving TMDs. Rugh and Solberg, in their discussion of oral health status in the United States, commented that “dental education is not preparing practitioners to manage TM disorders.” They concluded that “there is a clear need for dental education to explore promising new programs to reverse these trends.” In 1986, Roistacher et al. commented on the teaching of the management of chronic face pain, which included TMDs. They reported that students at 40 percent of dental schools in the United States were not exposed to a course dealing with the diagnosis and management of chronic facial pain. In 1990, McNeill et al., in discussing education about TMDs among other subjects, argued that the future directions of TMD activity needed to be in three areas: improved basic and clinical research; predoctoral, postdoctoral, and continuing dental education curricula; and relations with the health insurance industry. They commented that many current dental educational programs were not adequately training students to manage TMD patients. They concluded that predoctoral education programs should provide increased familiarity with diagnostic reasoning, radiology, neurology, physical medicine, and pharmacology including an increased emphasis on history taking, physical diagnosis, and the ability to understand complex diseases in a psychosocial context. Based upon the conclusions and recommendations provided by these authors, various shortcomings associated with TMD education existing in dental curricula during this period were identified. It would seem this would have served as a stimulus for dental education to embrace and implement their recommendations.

In 1990, due to the recognized lack of any standardized predoctoral TMD educational programs in the United States and Canada, the Association of University TMD and Orofacial Pain Programs, in conjunction with the American Association of Dental Schools (AADS; now the American Dental Education Association, ADEA), convened an educational conference (160 conference registrants) at the University of Medicine and Dentistry of New Jersey. The goal of the conference was to develop a complete curriculum outline for teaching TMDs, encompassing initiatives related to educational goals, core content, behavioral objectives, and continuing education. The curriculum guidelines were formally adopted by the AADS and were to be considered for inclusion in the American Dental Association’s Commission on Dental Accreditation (CODA) guidelines for evaluating and accrediting dental schools. The recommendations from this meeting, however, were never officially adopted by CODA.

A second educational conference was held in 1992 involving sixty-four participants in discussions regarding problem-based learning, decision analysis, and computer technology. The goal of this conference was to discuss educational methodologies for the implementation of formal TMD guidelines in the dental curriculum. This meeting prompted educators to retrospectively review if students were being taught using validated scientific evidence as well as the manner in which their learning was orchestrated. This process resulted in enhanced recognition of the need for a more integrated curriculum. A new paradigm focusing on greater integration of the basic and clinical sciences into overall health care education began to evolve.

Clinical decisions related to OFP/TMDs were also undergoing review. In the mid-1990s, the National Institutes of Health held a conference regarding the management of TMDs and concluded that a “consensus has not been developed across the practicing community regarding many issues, including which TMD problems should be treated and when and how they should be treated.” During
this period and early in 2000, it was becoming more obvious that there was a lack of overall consistency in treatment decisions in both medical and dental care.\textsuperscript{15} Ambiguity in management principles as well as the lack of clarity in educational curricula related to TMDs only created challenges and confusion as to what specific material should be taught.

A third educational conference involving more than 130 educators was convened in 2000 for the purpose of developing a curriculum for OFP/TMDs. The main objective of this conference was to enhance the teaching of the subject to predoctoral and postdoctoral students.\textsuperscript{15} The specific goals of that conference were to 1) determine the current status of the predoctoral and postdoctoral teaching of OFP/TMDs; 2) determine how basic sciences and oral medicine concepts could be better integrated into the teaching of OFP/TMDs; and 3) discuss how OFP/TMDs should be taught in a manner that was consistent with newly proposed CODA predoctoral accreditation standards.\textsuperscript{14} To the detriment of dental education in the matter of OFP/TMDs education, however, minimal action was taken, and few changes were implemented.

From the historical perspective, therefore, notwithstanding the efforts of specially designated conferences, no standardized curricula or requirements to establish guidelines were developed in regard to the topics associated with OFP/TMDs taught in dental schools. As a result, there was a lack of consensus among dental educators as to course content to be provided for dental students in this evolving field. This lack of standardization served to compound the confusion and frustration for predoctoral students during their training, with ramifications beyond their graduation.

The Present

In 2007, Klasser and Greene\textsuperscript{15} reported the results of a survey they conducted between June and December 2005 of all dental schools located in the United States (n=56) and Canada (n=10) to assess the status of the teaching about TMDs at the predoctoral level. The eleven-question survey was sent to the individual in each school identified as the principal person responsible for teaching TMDs to predoctoral students or to the dean, who was instructed to refer the survey to the appropriate individual. These researchers received responses from a total of fifty-five dental schools (response rate of around 80 percent).

Results of that survey indicated substantial progress in the teaching of didactic and clinical material related to TMDs since the 1973 Greene study. Current evidence supporting the relationship between OFP/TMDs and comorbidities with other medical conditions\textsuperscript{16-19} is now being taught at several institutions.\textsuperscript{15} Additionally, more dental schools\textsuperscript{15} are educating their students regarding the influence of psychological issues that significantly impact both diagnosis and treatment protocols, especially for chronic OFP/TMD patients.\textsuperscript{20-22} The current concepts of etiology and treatment approaches—with the main trend being a departure from a dentally based mechanical model to a biopsychosocial (medical) model\textsuperscript{23,24}—are also being taught in many dental schools.\textsuperscript{15}

Despite these positive developments in OFP/TMD education at certain dental schools, there appears to be an ongoing disparity between the teaching of contemporary evidence-based material and scientifically invalidated concepts. Due to these shortcomings in our current educational systems, Klasser and Greene\textsuperscript{15} recommended that minimum quantitative standards for the time and substance required to cover the management of non-dental facial pain problems be instituted within all predoctoral programs. They also suggested that OFP/TMDs be included in the accreditation standards for predoctoral dental education.

Related professional organizations have shown conflicting positions regarding this subject. The ADEA Competencies for the New General Dentist (as approved by the 2008 ADEA House of Delegates) includes the prevention, diagnosis, and management of TMDs as one of its core competencies (number 6.9).\textsuperscript{25} The International Association for the Study of Pain acknowledged the need for education of orofacial pain as a component of professional education as it developed a core curriculum on this subject.\textsuperscript{26} In contrast, CODA in its Accreditation Standards for Dental Education Programs at the predoctoral level did not include TMDs as part of the required minimum competencies in the standards that will be implemented in July 2013.\textsuperscript{25} However, CODA recently approved establishing an accreditation process for Advanced General Dentistry Education Programs in Orofacial Pain.\textsuperscript{28} This paradoxical recognition of accreditation at the advanced level with a minimization of mandated experiences/exposure at the predoctoral level creates a significant challenge as we look to the future. Without an adequate base of knowledge and clinical exposure at the predoctoral level, it is less likely that an individual would pursue advanced
training in the field of OFP/TMDs. This is a concern since it is recognized that pain, especially pain in the head, face, and neck, is so common in the general population. Therefore, it is important that dentists of the future be better educated in the diagnosis and management of OFP/TMDs.

Future

It is clear that dental education is focused on educating clinician-scientists, and emphasis on evidence-based health care has become the standard in education. However, questions remain about the future of predoctoral teaching of OFP/TMDs and its implications regarding patient care, formal advanced education, and clinical research. Issues such as the following need to be addressed: 1) the implementation of a validated, standardized educational model for OFP/TMDs education in all predoctoral programs; 2) the adherence by predoctoral students and all dental professionals to a scientifically based protocol for patient assessment; 3) the development of criteria for more complete and accurate diagnoses with the delivery of more predictable treatment outcomes; and 4) the establishment of a validated, standardized data collection protocol for clinical research involving all the categories of OFP.

To address these concerns and to emphasize predoctoral education in OFP/TMDs more specifically than has been done in the past, change is needed. Organizations such as CODA, ADEA, and the corresponding Canadian organizations are in a favorable position to spearhead change and its implementation. This change might start by following the recommendations of Klasser and Greene with an assessment and implementation of quantitative standards for the time allotted and material content to be established for predoctoral education in OFP/TMDs. It would also seem prudent that OFP/TMDs be included among the accreditation standards for dental education at both the predoctoral and postdoctoral levels.

In order to facilitate the changes that are required, there must be a shift in the paradigm of how dentistry is perceived. The routine and customary view that dentistry is a mechanical profession must be reevaluated. Dental education, using OFP/TMDs as a conduit, is in an ideal position to shift the thinking to a more medical direction. This can be accomplished by considering the dentist as the physician of the masticatory system and beyond. This approach is further justified as we start to better appreciate and understand the connection between oral disease and systemic conditions and the need for this to be taught in current dental curricula.

By accepting these changes and initiatives and with shifting paradigms, dental education will be positioned to embrace an Interprofessional Collaborative Practice as proposed by the Interprofessional Education Collaborative (IPEC), of which ADEA is a member. Bridges et al., upon reviewing the concept of interprofessional collaboration, defined interprofessional education (IPE) as “members or students of two or more professions associated with health or social care, engaged in learning with, from, and about each other.” IPE would provide an opportunity for various health care disciplines to share skills and knowledge, thus fostering a better understanding, shared values, and respect for the roles of other health care professionals. The importance of developing early IPE curricula and offering them before students begin to practice in order to build a basic value of working within interprofessional teams cannot be overstated. The goal of an IPE model is to develop an interprofessional, team-based, collaborative approach that improves patient outcomes and the quality of care.

A former ADEA president embraced this new model in arguing that individual schools/health science centers should integrate IPE components into their curricula and, when possible, design entire programs around IPE. At the same time, ADEA identified IPE as a top priority for 2011 and, as part of the IPEC, voiced its support for academic dental institutions to integrate models of IPE as a foundation for preparing students, residents, and fellows to provide patient-centered care. Additionally, the Institute of Medicine of the National Academies has recommended that IPE be implemented in educational models moving forward. To do so, we should identify areas that avail themselves of the IPE model.

The field of OFP/TMDs seems to lend itself ideally for integration into an IPE environment. Since pain is a complex sensory and emotional experience, especially chronic or recurrent pain, an interprofessional model employing a multidisciplinary assessment and management approach currently exists focusing on physical, psychosocial, and behavioral aspects. Members of the diagnostic and management team contribute not only their own knowledge and experience, but also contribute to the integration of that information into a multifaceted team approach. CODA, by accrediting Advanced General Dentistry
Education Programs in Orofacial Pain, has already embraced the concept of IPE. Hopefully, there will be a proliferation of these programs, thereby developing a better integration of basic science knowledge with refined diagnostic and treatment methods in an interprofessional environment. Since this model currently exists in advanced education, it would be most desirable that enhanced exposure occur at the predoctoral level. The ramifications of such an IPE model for dental education would be significant in empowering dental educators to migrate from an insular environment to one fostering interdisciplinary collaboration.

Conclusions

There currently exists an apparent disparity in standards and consistency of education at the predoctoral level in the area of OFP/TMDs. Clearly, there is a lack of standardization and validation of evidence-based educational materials in this field. This inconsistency could result in frustration for dental educators, confusion for students, and unfortunate consequences in patient care. Nevertheless, there is much reason for hope, as organized dentistry has understood and embraced the need for change. Currently, accreditation exists for Advanced General Dentistry Education Programs in Orofacial Pain, and initiatives have been implemented to encourage institutions to embrace new models for interprofessional education. Progress will not be an easy task as it will require the collaborative efforts of all stakeholders including dental education, organized dentistry, and professional organizations. Although change may not come easily, we as dental educators owe it to our students and patients to lead our field in this direction.

REFERENCES