General Dentists’ Evaluation of Anesthesia Sedation Education in U.S. Dental Schools

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Abstract: To assess the quality and quantity of sedation education in U.S. dental schools, a prospective, questionnaire-based survey was administered to general dental practitioners who graduated in 2003. Questionnaires were sent via facsimile to recent dental graduates using a list obtained through the American Dental Association. The response rate was 54 percent; 718 of the 1,328 nine-question surveys were returned. The response to the questionnaires indicates a perceived need for sedation care by the majority of recent graduates and low overall satisfaction with the quality of sedation education in U.S. dental schools. The general consensus of most 2003 dental school graduates is that they have gained little or no hands-on experience in sedation techniques and would have supported an increase in tuition and fees if an institution were to offer more efficient sedation training. With increased popularity and high patient demand for sedation techniques, the new dentist feels a need for sedation education before graduation.

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Key words: anesthesiology, dental education, sedation, survey

Submitted for publication 4/14/06; accepted 8/25/06

Traditionally, the practice of dentistry has a prevailing connection with fear and apprehension. These feelings of anxiety persist despite advances in techniques. Dionne et al. reported that 23 million people with dental fear were more willing to see a dentist if a form of sedation was offered; consequently, the use of this modality is becoming progressively important as a technique of dental treatment.¹ A need does exist for sedation services within dentistry, and the ability to care for the segment of the patient population with fear of dental treatment has become an important component of dental practice.

Most dental educators recognize the importance of sedation education; however, alternative perceptions exist about the extent of sedation training that is suitable for the dental school curriculum. There are issues of logistical feasibility at some schools with a limited number of patients and also issues related to the number of faculty available to provide close supervision. The role of dental education is to provide the graduate with sufficient training, experience, and education to be an entry-level competent general dentist. The dental graduate should be proficient in the management of pain and anxiety by pharmacological methods, as well as behavioral management. This nine-question survey was designed to assess perceptions regarding the quality and quantity of sedation education received by recent graduates of dental schools in the United States.

Methods

The study was designed as a prospective, questionnaire-based survey. The survey was undertaken from October to December 2005. This project was reviewed and approved by the Institutional Review Board at the University of Pittsburgh School of Dental Medicine.

The questionnaire was designed to collect information about general dentists’ perceptions of the quality in instruction for sedation techniques during their undergraduate dental education and determine the respondents’ overall satisfaction with the teaching of sedation techniques. The nine questions were:

- What dental school did you attend?
- Specify how many demonstration and/or hands-on sedation cases you participated in during your dental school career.
- Which of the following techniques do you currently use in the dental office where you are employed?
- In general, do you feel you have been properly trained/educated in the field of sedation anesthesiology?
• Rate the quality of education at your institution in nitrous oxide administration, oral sedation, and intravenous (conscious) sedation.
• Do you perceive a need from your dental patient population for sedation services?
• How should dental schools offer sedation anesthesia training?
• Would you support an increase in tuition and fees, or would have attended a more expensive dental school, if the institution were to offer more efficient sedation training or the ability to attain an anesthesia permit?
• Do you believe that dental anesthesiology should be recognized by all dental governing bodies as a specialty of dentistry?

Questionnaires were sent via facsimile to 1,328 full-time general practitioners using a list obtained through the American Dental Association. All distributed questionnaires were accompanied by a letter containing the following: a description of the purpose of the study, an explanation of the questionnaire, and directions on how to properly complete and return the survey to the investigators.

Data from the returned questionnaires were entered onto an Excel spreadsheet. Quantitative analyses were confined to summation of variables, an estimation of means, and a valid percent for identified variables.

Results

A total of 718 of the 1,328 nine-question surveys were returned, which represents a 54 percent response rate. Responses for each question are summarized as follows.

Question 1: What dental school did you attend?

All fifty-three accredited U.S. dental schools with a 2003 graduating class were represented within the questionnaire response.

Figure 1. Responses to Question 2: percentage of general dentists who reported various numbers of demonstrations and/or hands-on sedation cases during their dental school careers (N=718)
Question 2: Specify how many demonstrations and/or hands-on sedation cases you participated in during your dental school career.

The quantity of demonstrations and/or hands-on sedation cases in which survey respondents participated is shown in Figure 1. Overall, the responses indicate that, at the majority of represented dental schools, graduates received little or no hands-on experience with sedation practices. Approximately 24 percent of 2003 dental graduates received zero exposure to hands-on sedation education, while 58.8 percent participated in only one to ten total cases. In addition, the mean number of cases that involved student sedation education was reported at 1.99.

Question 3: Which of the following techniques do you currently use in the dental office where you are employed?

Approximately 35 percent indicated that local anesthesia is sufficient for patient care, while 65.1 percent use some sedation technique in their offices. Among respondents reporting use of sedation, 21.6 percent used nitrous oxide alone, 17.1 percent used strictly oral sedation, 19.5 percent combined both nitrous oxide and oral methods, and 6.9 percent utilized intravenous sedation, oral sedation, and nitrous oxide.

Question 4: In general, do you feel you have been properly trained/educated in the field of sedation anesthesia?

In our study, 58.8 percent of recent dental graduates considered themselves insufficiently trained in the field of sedation anesthesiology.

Question 5: Rate the quality of education at your institution in nitrous oxide administration, oral sedation, and intravenous (conscious) sedation by circling the number that corresponds to your rating. [5-Excellent, 4-Above Average, 3-Average, 2-Below Average, 1-Poor]

As shown in Table 1 and Figure 2, respondents’ perceptions of the quality of education varied between sedation techniques. While the survey responses suggest nitrous oxide instruction in U.S. dental schools was thought to be sufficient by responders, overall there was low satisfaction with oral and intravenous sedation instruction.

Demonstrating the highest mean score of 3.33, nitrous oxide education was rated by 80.2 percent of respondents as average to excellent, with 16.6 percent of surveyed dentists stating that they received excellent education in this procedure. On the other hand, 67.9 percent and 69.2 percent of new dentists graded intravenous and oral sedation, respectively, as below average or poor.

Question 6: Do you perceive a need from your dental patient population for sedation services?

At 93.7 percent, an overwhelming majority replied yes to this question, while only 6.3 percent felt that their patients did not require any type of sedation care to augment their dental treatment.

Question 7: How should dental schools offer sedation anesthesia training?

The responses to this question are as follows:
- No need to offer any training, 4.8 percent
- Nitrous oxide training with licensure, 13.4 percent
- Oral sedation and nitrous oxide training, 53.3 percent
- Intravenous (conscious) sedation, nitrous oxide, and oral sedation, 28.0 percent

Question 8: Would you support an increase in tuition and fees, or would have attended a more expensive dental school, if the institution were to offer more efficient sedation training or the ability to attain an anesthesia permit?

A high percentage (78.1 percent) of new graduates indicated that they would have paid higher fees for more efficient sedation instruction.

Question 9: Do you believe that dental anesthesiology should be recognized by all dental governing bodies as a specialty of dentistry?

Table 1. General dentists’ ratings of the quality of their dental school education in three categories of sedation techniques (N=718)

<table>
<thead>
<tr>
<th>Category</th>
<th>Excellent</th>
<th>Above Average</th>
<th>Average</th>
<th>Below Average</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrous Oxide Sedation</td>
<td>16.6%</td>
<td>28.1%</td>
<td>35.5%</td>
<td>11.3%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Oral Sedation</td>
<td>1.9%</td>
<td>5.6%</td>
<td>23.2%</td>
<td>30.4%</td>
<td>38.8%</td>
</tr>
<tr>
<td>Intravenous Sedation</td>
<td>4.7%</td>
<td>4.8%</td>
<td>22.6%</td>
<td>21.9%</td>
<td>46.0%</td>
</tr>
</tbody>
</table>
Just over 60 percent of survey respondents agreed that dental anesthesiology should be a specialty of the dental profession.

**Discussion**

The results of this survey indicate that this nationwide sample of 718 dentists, who were 2003 graduates of every U.S. dental school, perceived that their predoctoral education provided inadequate opportunities to learn and experience sedation techniques, and thus they felt inadequately prepared in this aspect of outpatient anesthesiology. The ADA Guidelines in Teaching Comprehensive Control of Anxiety and Pain for the Dental Student provide a template for educating students in pharmacological strategies, as well as psychological management of the anxious patient. This educational framework states that the predoctoral curriculum should provide students with education in apprehension and pain management, including sedation and emergency management. The recommendations for the quantity of training contained within the stratagem are general and maintain the amount of clinical experience required to achieve competency will vary according to student capability and instruction techniques.

In contrast, most state dental boards have specific educational regulations to practice these aspects of anesthesiology. Given that most state requirements vary among dental boards, a conundrum is created within the dental curriculum concerning the appropriate level and quantity of education for the dental student.

The survey response demonstrates that a large majority, 83 percent, of 2003 dental graduates received clinical experience in ten cases or fewer during their dental school careers. Furthermore, 24 percent of respondents did not participate in any clinical sedation cases before graduating. Practical experience in anesthesiology is a key component of sedation education. The opportunity for most students to gain clinical experience appears varied and is limited or nonexistent at some dental schools. These findings suggest that it may be necessary for some schools to develop a minimal baseline curriculum, especially when students received no experience at all.

It is crucial not only to assess the quantity of

![Figure 2. Responses to Question 5: general dentists’ rating of the quality of sedation education at their dental school (N=718)](image)
sedation education but also to measure the quality. The survey results demonstrate that responding dentists were content with nitrous oxide instruction, but dissatisfied with oral and intravenous sedation education. Considering that the majority of new dentists perceive the quality of predoctoral education was lacking, there does appear to be a low priority placed on this type of training in U.S. dental schools.

Conclusion

Sedation teaching at the predoctoral level appears to be a low curricular priority at the majority of U.S. dental schools. Paradoxically, the clinical need to provide sedation to meet patient expectations is increasing.1,6 Practitioners with a desire to adopt sedation practices need to be appropriately trained, and the foundation for any sedation education must begin in the predoctoral curriculum. The outcome of this survey demonstrates variability and lack of applied experience in sedation education during dental school. The accountability for action rests with dental educators and regulators; they must cultivate sedation education in the U.S. predoctoral dental curriculum.

REFERENCES