Resident Evaluation of Orthodontic Programs in the United States


Abstract: The objective of this study was to investigate the satisfaction of orthodontic residents in the United States with their programs and determine the scope of their training. Program chairs/directors of all sixty-five U.S. orthodontic graduate programs were contacted for permission to email their residents. A total of 335 residents from thirty-seven programs were invited to complete an anonymous, online, fifty-seven-item survey in May 2007. Data were categorized, and basic statistics were performed. A total of 136 (40.60 percent) residents completed the survey. Overall, 75.74 percent were satisfied with their program. Residents said they feel they receive appropriate didactic teaching sessions and dedicated academic time (60.29 percent). Most residents (92.70 percent) indicated their program offers training in numerous philosophies, while 80.29 percent said they have sufficient clinically based training and 59.85 percent said they have sufficient research-based training. A total of 57.66 percent said they will not complete more than thirty cases from start to finish and on average treat two orthognathic surgery, thirteen extraction, twenty-four nonextraction, and nine adult patients. Most (92.70 percent) said their program contains care for disabled or underserved patients; most (92.70 percent) said they feel they will be adequately prepared to provide unsupervised orthodontic care after graduation; and 54.41 percent said they think other specialties have a positive view of orthodontics. Only 58.09 percent indicated they have a formal interdisciplinary program for treating patients. We conclude that U.S. orthodontic residents are satisfied with their programs. They receive training in a variety of approaches; however, inadequacies in exposure to interdisciplinary teaching and a limitation of the number of cases started and completed were identified. These observations may be a result of program length due to the preponderance of twenty-four- to thirty-month programs.

Keywords: orthodontic residents, orthodontic education, resident satisfaction, survey

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According to the results of an American Dental Association (ADA) survey, orthodontics is the most popular of all the dental specialties in the United States, receiving the highest percentage of applications from graduating dental students.1 Currently, there are sixty-five accredited orthodontic programs in the United States, enrolling more than 700 residents. These programs range in length from two to four years, with some offering a certificate in orthodontics and some offering M.Sc. and/or Ph.D. degrees. No previous studies have assessed the overall satisfaction of U.S. orthodontic residents with their programs and the scope of their training. One such study was undertaken in Canada.2

Previously, a series of surveys of orthodontic programs in the United States and Canada sponsored by the American Association of Orthodontists (AAO) Council on Education were conducted with program directors, not the orthodontic residents themselves.3-6 These studies conducted in 1983, 1989, 1994, and 1999 examined the status of graduate orthodontic education, identified strengths and weaknesses within programs, collected information on the clinical and didactic curricula, established a basis to compare programs over time, and identified educational trends. Further, they examined graduate orthodontic education as it relates to program organization, graduate students, faculty, facilities, clinical details, treatment techniques, research, and curriculum.
By contrast, the objective of our study was to investigate the didactic and clinical treatment experiences, number of clinical cases undertaken, completion rates, techniques used, and research component of graduate orthodontic programs in the United States as reported by graduate students themselves. The overall satisfaction of orthodontic residents with their programs and their sense of preparedness to provide orthodontic treatment upon graduation were also investigated.

**Methods**

The study received approval from our university Research Ethics Board. The survey instrument was developed based on the instrument used in the Canadian study. The survey was completed by several orthodontic residents in a pilot-test to determine completion time and identify components that needed revision or clarification. Faculty members in orthodontic residency programs also reviewed the survey and provided suggestions about content and format. The survey was not formally assessed for validity and reliability. Orthodontic program chairs and directors (the same person in some programs) from each of the sixty-five accredited U.S. orthodontic programs in the ADA’s list were contacted by email for consent for their residents to participate in the survey. The survey was attached to the emailed message, and recipients were asked for permission to contact their residents by email and invite them to anonymously participate in the survey. Program directors or chairs who did not respond were then contacted an additional three times by telephone.

An email with a personalized online link was sent to a total of 335 residents from the thirty-seven orthodontic programs whose directors granted permission to contact their residents. These programs were distributed throughout the United States. The personalized online link prevented respondents from completing the survey more than once. In May 2007, residents were invited to complete an anonymous fifty-seven-item survey containing multiple-choice and one-line answers. As an incentive to participate, residents who completed the survey in its entirety were entered into a random drawing for an orthodontic curing light. To ensure privacy and anonymity, no personal information was collected, a point emphasized to all residents with each email communication. In addition, participants were assured that the results would be reported only as group data.

The survey was divided into the following segments: demographics, reasons for choosing orthodontics, evaluation of their program, and future directions. Data were then compiled into a Microsoft Excel spreadsheet and categorized by demographic variables. Basic statistics and comparative analyses using chi-square analysis were undertaken by gender, age, and year of program.

**Results**

Eighteen program chairs or directors responded to the initial email request. After three additional telephone contacts, the email addresses of 335 residents were obtained from the directors of thirty-seven graduate orthodontic programs. Some program directors/chairs forwarded the email to all their residents and asked them to contact the author if they were interested in participating. In some cases, a single resident from a program was invited to participate. From these residents, a total of 138 started the survey, and 136 completed it in its entirety, resulting in a response rate of 40.60 percent. The average time taken to complete the survey was twelve minutes.

Of the respondents, eighty-nine were male and forty-nine female. The vast majority were in the age range of twenty-five to thirty-four years (90.58 percent). Most (64.23 percent) had entered their graduate residency program directly from dental school and had not worked either in private practice or a residency program. Only nine (4.95 percent) had previously earned a graduate degree. Chi-square analysis revealed no significant difference between gender or age categories (p>0.05).

Thirty-one (22.63 percent) of the respondents were in the first year of their program, sixty-seven (48.91 percent) in the second year, thirty-four (24.82 percent) in the third year, and five (3.65 percent) in the fourth year. Other than their required dental degree, 116 (63.74 percent) had a bachelor’s degree, fifty-seven (31.32 percent) had an unspecified diploma, six (3.30 percent) had a master of science degree, and three (1.65 percent) had a doctoral degree/Ph.D./D.Sc.

Sixty-eight respondents (49.28 percent) said they felt they had the right amount of exposure to orthodontics in their undergraduate dental curriculum. Sixty-five (47.10 percent) said they had too little exposure, four (2.90 percent) said they had no exposure, and one (0.72 percent) said there was too much.
Overall Satisfaction with Program

The majority of the respondents (103; 75.74 percent) said they were either “very satisfied” or “satisfied” with their program (Figure 1). Twelve (8.82 percent) said they were somewhat dissatisfied, six (4.41 percent) said they were very dissatisfied, and fifteen (11.03 percent) reported being neutral. When asked if their program offers exposure and training to numerous orthodontic treatment philosophies, most (127; 92.70 percent) said “yes,” while ten (7.30 percent) said “no.”

Most residents (eighty-two; 60.29 percent) reported that they have just the right amount of formal didactic teaching sessions or dedicated and protected academic time. Thirty-two (23.53 percent) said that although these components were included in their program, not enough time was allocated, while nineteen (13.97 percent) said there was too much and three (2.21 percent) said it was not offered. A total of 110 (80.29 percent) indicated they have the right amount of clinical-based training, twenty (14.60 percent) said there was too little, six (4.38 percent) said there was too much, and one (0.73 percent) was unsure. The majority (eighty-two; 59.85 percent) said that the amount of research-based training was just about right, thirty-six (26.28 percent) said it was too much, fourteen (10.22 percent) said it was too little, and five (3.65 percent) were unsure.

Scope of Educational Training

Seventy-nine respondents (57.66 percent) said they will start and complete at least thirty patients by the end of their training program (Figure 2). The residents were also asked how many orthognathic surgery, extraction, and non-extraction patients and how many adults they estimate they will have completed from start to finish by the end of their program. These results are presented in Table 1. The respondents estimated that they will have treated an average of 17.23 patients in the mixed dentition (range 2 to 120). A total of 124 respondents (90.51 percent) said that their program includes care for disabled or underserved patients, and ninety-four (68.64 percent) said they felt there was a fair balance between the education and service aspects of their program.

Most respondents (127; 92.70 percent) reported feeling they will be adequately prepared to enter the workforce after graduation. When asked about the perception of other dental specialties towards orthodontics, eleven (8.09 percent) said that other dental disciplines have a strongly positive view of orthodontics, sixty-three (46.32 percent) said a somewhat positive view, thirty (22.06 percent) said a neutral view, twenty-nine (21.32 percent) said a somewhat negative view, and three (2.21 percent) said a strongly negative view. Only seventy respondents (58.09 percent) said their program has a formal interdisciplinary program for treating patients. Of these, respondents said the most collaboration takes place with the disciplines of oral surgery, periodontics, and prosthodontics (Figure 3).

Discussion

Our study gave orthodontic residents in the United States the opportunity to confidentially and
anonymously reflect on the scope of and their overall satisfaction with their graduate orthodontic educational program and experiences. Moreover, the online survey allowed them to complete the survey at a time and place convenient for them.

A total of 136 of the 335 residents (response rate of 40.60 percent) who were sent an email completed the entire survey. The smaller sample size was influenced by access to email addresses since many program chairs/directors did not respond to repeated email or telephone requests, and some refused to provide email addresses, perhaps due to privacy issues. Due to this incomplete response, there may be limitations to the generalizations that can be drawn from the results of this investigation. Also, residents contacted may not have been interested in participating in a relatively lengthy questionnaire despite being advised it would take only ten to fifteen minutes. Although a small sample size was obtained, it nonetheless is a representation of orthodontic residents from thirty-seven programs distributed throughout the United States, and general conclusions can be drawn.

Only one other survey, undertaken in Canada,\(^2\) has evaluated the clinical and research curriculum and overall satisfaction of orthodontic residency programs from the perspective of the residents themselves. Previous graduate orthodontic education surveys administered to program chairs in the United States and Canada were comprehensive investigations reporting on a variety of areas of graduate orthodontic education including program organization, graduate students, faculty, facilities, clinical details, treatment techniques, research, and curriculum.\(^3\)-\(^6\) However, those studies solicited responses from program directors and thus, by definition, provided a perspective different from our study, which reports the confidential and unfettered opinions of the consumers of graduate orthodontic residency programs—the residents themselves. The surveys of program directors were different from our survey, making direct comparisons difficult. However, the survey conducted with orthodontic residents in Canada was similar to ours, thus allowing for comparison of U.S. and Canadian residents’ perspectives.

Table 1. Number of patients in specified areas that responding U.S. orthodontic residents estimate they will treat from start to finish during their training

<table>
<thead>
<tr>
<th>Treatment Procedure</th>
<th>Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orthognathic Surgery</td>
<td>2</td>
<td>0–12</td>
</tr>
<tr>
<td>Extraction</td>
<td>13</td>
<td>1–100</td>
</tr>
<tr>
<td>Nonextraction</td>
<td>24</td>
<td>2–50</td>
</tr>
<tr>
<td>Adults</td>
<td>9</td>
<td>0–25</td>
</tr>
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Overall Satisfaction with Program

Our survey found that the majority of responding orthodontic residents (75.74 percent) in the United States were satisfied with their program. This suggests that U.S. orthodontic graduate programs are meeting the subjective needs of their residents. It is noteworthy that eighteen (13.23 percent) respondents indicated that they were either somewhat dissatisfied or very dissatisfied. Program directors may want to consider regular feedback sessions, year-end reviews, and exit surveys to identify the reason(s) for both satisfaction and dissatisfaction. This information could help to strengthen programs by addressing areas of concern. It is also worth noting that a higher percentage (86.36 percent) of Canadian respondents in the comparable study were satisfied with their program. This finding is likely multifactorial but may be a function of individual differences between the two groups of residents, differences in program curriculum and length, and interaction with faculty.

The majority of U.S. residents responding to our survey (92.70 percent) said their program offers training in numerous treatment philosophies. Of interest is that some respondents (7.30 percent) indicated they were taught only one treatment approach. Exposure to a broad range of treatment philosophies is desirable in light of the myriad of treatment approaches. Exposure to only one treatment philosophy may be a function of program length (often two years) of some U.S. orthodontic programs, in which enough time may not be available to teach multiple philosophies. All programs in Canada are three years in length, and this may be the reason why all respondents in the comparable study indicated that their program offers training in numerous treatment philosophies, as more time may be available for didactic treatment planning sessions. Indeed, slightly more responding residents in Canada (66 percent) than the United States (60.29 percent) said they had “just the right amount of formal didactic teaching sessions or dedicated and protected academic time,” while in the United States, 23.53 percent said there was not enough and 2.21 percent said it was not offered. This finding may also be a result of the academic crisis that currently exists in both the United States and Canada, in which programs have a shortage of full-time faculty and are relying more on part-time instructors.

More Canadian (93 percent) as compared with U.S. responding residents (80.29 percent) said they have the right amount of clinical-based training. This finding likely reflects more available clinical time in the three-year Canadian programs by comparison with the two-year programs that account for approximately half of the U.S. graduate orthodontic programs. Further, more Canadian residents (73 percent) indicated their research-based training is “just about right” as compared with their U.S. counterparts (59.85 percent). This difference may reflect program length and the requirement in Canadian programs that residents have already earned a master of sci-

Figure 3. Dental specialties that responding U.S. orthodontic residents said they collaborate with in their training (n=549; respondents were allowed to choose multiple specialties)
ence degree. This finding suggests that U.S. residents may not be adverse to a required master of science component in their program.

More responding residents in the United States (92.70 percent) versus Canada (86.36 percent) indicated they feel adequately prepared to enter the workforce after graduation. This, however, is a subjective assessment of clinical ability, and residents may not know what they do not know. Perhaps the extended length program provided time for Canadian residents to see more cases and in greater depth, allowing them to understand the complexity and difficulty that can exist in diagnosis, treatment planning, and finishing orthodontic cases. This understanding may give some residents more apprehension of the true extent of their knowledge and ability and therefore encourage them to value the importance of orthodontic experience. Though residents may say they feel ready for clinical practice, they may not have adequate experience to appropriately judge their actual ability.

Scope of Orthodontic Curriculum

The AAO-sponsored studies found a steady increase in the caseload that program directors said residents will treat—from fifty-eight in 1983 to eighty-five in 1999—and a steady increase in the number of case starts from twenty-five in 1983 to forty-three in 1999. This finding cannot be directly compared to our study because we questioned the orthodontic residents themselves about how many cases they estimate they will start and complete during their program. Over half of our respondents (57.66 percent) indicated they will start and complete at least thirty cases, while 42.32 percent said they will start and complete fewer than thirty cases. This completion rate finding likely reflects the reality of available clinical time and program length, especially in two-year programs. As a consequence, these students depend heavily on transfer cases for additional clinical experiences and exposure. In contrast, all Canadian residents said they expect to complete a minimum of thirty patient cases from start to finish, and 25 percent said they will start and finish more than seventy cases. This finding suggests that three-year programs give residents increased clinical exposure and experience and the opportunity to evaluate the stability of their treatment and outcomes of different retainer prescriptions. Responding U.S. residents in our study indicated that they will start and complete an average of two orthognathic surgery patients, which is in direct contrast to the 1999 program directors’ assessment that residents would treat on average 5.9 patients. Canadian residents reported they would start and finish an average of 4.89 orthognathic surgery cases. Canadian orthodontic residents likely start more orthognathic surgery cases than their American counterparts since surgical costs of orthognathic procedures done in Canadian hospitals are typically covered by provincial and territorial health care services. Thus, it appears that residents in Canada receive more clinical exposure to patients receiving orthognathic surgery.

In addition, responding U.S. residents in our study said they treat on average thirteen extraction and twenty-four nonextraction patients as opposed to their Canadian counterparts who said they treat twenty-four extraction and thirty-one nonextraction cases. This breakdown in both countries supports the notion that the current paradigm of treatment favors a nonextraction approach. Finally, responding U.S. residents in our study said they treat on average nine adult patients, one more than their Canadian counterparts, and that they treat, on average, more patients in the mixed dentition (17.23) than the Canadian residents (13). This finding may reflect the direction of organized orthodontics to early treatment.

In a recent editorial, Lindauer stated that “no scientific data suggest that graduates of 24-, 27-, or 30-month programs are less capable as clinicians or lack significant orthodontic knowledge compared with graduates of 36-month programs.” Although our study does not directly compare graduates from shorter versus longer program regarding their clinical, analytical, and didactic orthodontic knowledge, it does suggest that graduates from longer programs are likely to start and complete more patients and have both more diversified clinical education and greater exposure to a broader range of treatment philosophies as well as more clinical and research time. This suggests that, upon graduation, residents from longer programs may be better prepared for clinical practice. More clinical education will facilitate the process for them to become certified by the American Board of Orthodontics. Further, increased research experience will likely make them more capable of critically evaluating and appreciating the orthodontic literature. Indeed, the information from this study can assist with the recent debate in the literature over the appropriate length of an orthodontic program. The deficiency of the current study is that, to ensure anonymity to the respondents, two- and three-year programs could not be separately grouped and directly compared to one another.
Of concern was our finding that only 58.09 percent of responding residents indicated their program has a formal interdisciplinary program for treating patients, particularly in light of the articulated current paradigm recommending comprehensive interdisciplinary care. The 1999 AAO survey found that slightly more (two-thirds of programs) offer interdisciplinary courses. Orthodontic programs should be leaders in promoting a team approach to treatment, and interdisciplinary seminars, treatment planning sessions, and clinics should be fundamental components of all graduate programs in dentistry. These programs are uniquely positioned to provide residents with these invaluable opportunities to provide the best available treatment for their mutual patients at the same time they learn interdisciplinary communication and teamwork.

When responding residents in our study were asked what dental specialties they most collaborate with and could select all disciplines that applied, they indicated that most collaboration takes place with oral surgery, periodontics, and prosthodontics (Figure 3). This finding can be used as a guide for program directors to institute formalized interdisciplinary learning programs. These programs can be implemented even in the absence of other graduate specialty programs by organizing seminars and treatment planning sessions with instructors and specialists in these areas.

The AAO-sponsored studies found that the research aspect of orthodontic programs has been steadily decreasing while the clinical component has been increasing. The amount of time in the curriculum dedicated to research has diminished as well as the number of residents publishing papers, reflecting the increased time dedicated to treating patients. The authors of those studies asserted that this may be due to residents wanting to graduate with more clinical experience and also because programs are increasingly expected to generate more revenue. Educational leaders like Kharbanda have asserted that there is a greater emphasis being placed on clinical training, and the result is a reduced amount of time for research. A further complication and undesirable result of this approach to graduate orthodontic education is the dearth of graduates of residency programs interested in pursuing academic and research careers.

A total of 91 percent of U.S. residents responding to our survey indicated that their program provides care for disabled or underserved patients, which is significantly more than the responding Canadian residents, about half of whom said their programs do. In most instances, patients of lower socioeconomic status are unable to access private oral health care because of high fees and thus seek care at reduced cost at academic dental institutions. Orthodontic programs in the United States may be fulfilling this important social service and instilling a sense of social consciousness and responsibility in their residents.

Conclusions

Overall, our survey found that responding orthodontic residents in the United States are satisfied with their program, although they may not be receiving as comprehensive training and having the opportunity to start and complete as significant a number of patients as their Canadian counterparts. According to the responding residents, programs in the United States appear to be adequately providing care to underserved populations and disabled patients. However, those programs could improve opportunities for their residents to treat patients requiring interdisciplinary treatment.

REFERENCES