Dental Students’ Perceptions of Dental Specialties and Factors Influencing Specialty and Career Choices


Abstract: The goals of this study were to 1) evaluate dental students’ perceptions of dental specialties, 2) identify factors that play an important role in students’ decision to pursue specialty training or career choices, and 3) establish a baseline of students’ perceptions of the dental fields with the best future in terms of salary, personal and patient quality of life, and overall impact on the dental profession. Surveys were distributed to 494 students at the University of Pennsylvania School of Dental Medicine. Data were collected from 380 traditional four-year students and thirty advanced standing students. Chi-square tests, multivariate analysis, and logistic regressions were used to determine associations and independent contributions of student demographics to their perceptions of dental specialties and factors influencing specialty training or career choices. Debt was a statistically significant factor (p<0.001) in choosing specialty training or career independent of gender, age, or class year. Enjoyment of providing care in a specialty or field was identified as the single most important factor in choosing a specialty career. Half of the respondents had decided not to specialize. Pursuing postdoctoral general dentistry training and private practice in general dentistry were the most commonly reported plans after completion of dental school. Suggestions are made for ways to inform students about specialty training.

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In many countries, the subject of personal and financial gain versus altruistic reasons associated with students’ decision to enter dentistry has been a highly discussed topic in the literature, with several studies exploring the various reasons why dental students chose to enter the profession. One of the few studies to investigate the reasons why U.S. dental students chose the dental profession found that working with people, autonomy, and self-employment were their most important reasons for choosing a career in dentistry, while the prestige associated with the profession was the least important factor. However, in a qualitative review of the factors that motivated students to pursue dentistry as a profession, desire to help people was found to be one of the most prominent reasons why students chose dentistry. Also, in a comparative investigation of dental and medical students’ motivations towards their career choices, dental students showed more of a commitment to personal and financial gain as central motivating factors and were less motivated by working with people and patient care than the medical students.

A financial rate of return for a dental education was first calculated in 1969 and again in 1978, at which time it was concluded that “prospective dental students can expect to earn a lifetime premium large enough to recoup educational costs plus earn a positive return.” In the 1980s, debt was reported to have little effect on career choices of dental students after graduation. However, a recent study found that the majority of students planned to enter the general practice of dentistry to pay off their educational debt; when debt was removed as a factor, most students choose to pursue specialty training. Furthermore, a report of the American Dental Education Association (ADEA) noted that, on average, 50 percent of senior dental students from 1985 to 2008...
chose practicing general dentistry as an immediate plan after graduation independent of gender or debt accrued at graduation.4

Much remains to be learned about students’ perceptions of dental specialties and influencing factors on specialty and career choices once they enter dental school or how students’ age, gender, and already accumulated and future debt impact these perceptions and decisions. The current literature on students’ perceptions of dental specialties and factors that influence their specialty and career choices once they have entered dental school is scarce. While one report documented the importance of personal quality of life as taking precedence when dental students choose a career,2 there are no reports of studies that holistically explored students’ perceptions of the aspect of dentistry that would offer the best salary, personal and patient quality of life, and overall impact on the profession. The goals of our study were thus to 1) evaluate one group of dental students’ perceptions of dental specialties, 2) identify factors that play an important role in predoctoral and advanced standing dental students’ decision to pursue specialty training or career choices, and 3) establish a baseline of students’ perceptions of the dental fields with the best future in terms of salary, personal and patient quality of life, and overall impact on the profession of dentistry.

Materials and Methods

Recognizing the need for information about dental students’ perceptions of dental specialties and factors that influence their career choices after they have entered dental school, we conducted a survey of four-year dental students and advanced standing students14 at the University of Pennsylvania School of Dental Medicine (UPennSDM). Institutional Review Board approval was obtained for this study from the Office for Research Subject Protection at UPennSDM.

In 2008, a survey (available from the corresponding author) was hand-distributed during class to current students and mailed in a paper format to recent graduates. Validation of the survey was completed through our literature review, which revealed that there were no specific reports in the literature on U.S. dental students’ and advanced standing students’ perceptions of dental specialties and scarce data on the analysis of variables such as demographics and influencing factors on their specialty or career choices. As a result, the survey was created de novo by the authors, who reviewed the content with the research team and statisticians to ensure that questions were quantitative and reflected appropriate phrasing. Furthermore, the survey instrument was completed by a smaller student sample size (n=167) at the Harvard School of Dental Medicine. The survey included questions that gauged student perceptions of variables associated with general dentistry and dental specialty fields, as well as a separate set of questions on the field of prosthodontics, which are outside the scope of this article and have been reported separately.15

Four-year students surveyed were in the UPennSDM predoctoral classes of 2008, 2009, 2010, and 2011; also included were advanced standing students in the classes of 2009 and 2010. The survey instrument was hand-distributed in randomly selected didactic classes. The response rate for the alumni class of 2007 was 11 percent and was not included in the data analysis. The third- and fourth-year advanced standing dental students were analyzed collectively within each class year due to the small sample size. The paper format allowed only one response per respondent. The respondents completed the survey anonymously and voluntarily.

A cover letter (from authors MD and VCP) that communicated the purpose of the survey and included a statement of confidentiality to safeguard data and identity of respondents accompanied the paper surveys and mailings. The letter contained notice of approval and the name of a contact in the Office for Research Subject Protection at UPennSDM to give the respondent an opportunity to validate the survey’s legitimacy. Collected student demographics included information on class year; gender; age group; amount of time that had passed between college, other professional programs, and dental school; amount of debt accrued before dental school and debt expected to be accrued at graduation; if and when students decided to specialize; career path planned to pursue; factors influencing specialty choices; and perception of the field with the best future in terms of salary, personal quality of life, patient quality of life, and overall impact on the profession of dentistry.

The data were manually entered and stored anonymously in electronic format as a Microsoft Excel 2003 file. A total of 410 completed surveys were analyzed using descriptive statistics for demographic variables. Chi-square tests, univariate and multivariate analyses, and logistic regressions with statistical software (SAS Version 9.1, SAS Institute, Cary, NC) were used to determine associations and independent
contributions of student demographics (age, gender, class year, time between college and dental school) to accrued debt, factors influencing career choice, career planned, and perceptions regarding dental specialties. The significance level was set at 0.05.

Results

The overall response rate was 83 percent, with 410 respondents out of 494 surveys distributed to currently enrolled four-year dental students and advanced standing students at UPennSDM. The majority (88 percent) were between the ages of twenty and twenty-nine years; thirty-eight respondents (9 percent) were between the ages of thirty and thirty-four and ten (2 percent) were between thirty-five and thirty-nine. The student distribution based on class year was as follows: 125 students in the class of 2008, fifteen students in the class of advanced standing 2008, 108 students in the class of 2009, fifteen students in the class of advanced standing 2009, 103 students in the class of 2010, and forty-four students in the class of 2011. The female to male ratio (56 percent to 44 percent) of the 410 respondents is slightly higher for females than those reported for U.S. and foreign dental schools. The majority of the four-year students (56 percent) had transitioned immediately and directly from college to dental school, and 20 percent had one year between college and entering dental school. By contrast, 48 percent of the advanced standing students reported more than five years between graduation from their home country dental school and entering dental school in the United States.

Educational Debt

The participants were asked how much debt they had accrued in college before entering dental school and how much they expected to have accrued by the time they graduated from dental school. Sixty-seven percent of the four-year student respondents reported having no college debt, and 28 percent reported less than $50,000 in college debt. One-third of the four-year students reported expecting to have an accrued debt upon dental school graduation between $151,000 and $250,000 (Figure 1). Nineteen percent of these respondents expected to have an accrued debt upon graduation between $251,000 and $300,000, and 11 percent expected to have no accrued debt upon graduation. The advanced standing students’

![Figure 1. Debt expected to be accrued upon dental school graduation by the traditional four-year program dental students in study (N=380)](image)
expected accrued debt upon dental school graduation ranged from none to more than $451,000 (Figure 2).

Expected accrued debt for the total respondents was not statistically significant when gender was considered as a variable (p=0.33), but it is interesting to note that when looking at the second most commonly reported expected debt upon graduation ($251,000 to $300,000), twice as many females (n=48) reported this range than males (Figure 3). Expectations of accrued debt were similar across all class years, but differences in age group significantly impacted students’ expectations of accrued debt upon graduation (p<0.0001). The majority of the twenty-five to twenty-nine-year-olds reported an expected accrued debt of $251,000 to $300,000 (Figure 4). The accrued debt of $251,000 to $300,000 was also the overall most commonly expected debt level when age was not considered as a factor.

Career Path and Influencing Factors

When asked when they had decided to pursue a specialty in dentistry, 51 percent of the total respondents said they did not plan to specialize. After that, the largest group (21 percent) said they decided to specialize before dental school, while 10 percent decided in the first year of dental school, 6 percent in the second year, 11 percent in the third year, and only 1 percent in the fourth year.

Regardless of class year, gender, age group, or debt, the majority of students planned to either pursue postdoctoral general dentistry (i.e., enter GPR/AEGD programs) or enter the private practice of general dentistry and not specialize (p<0.0001). Students with the greatest amount of expected debt planned to pursue private practice in general dentistry or GPR/AEGD independent of class year, gender, or age group. There was a statistically significant difference between males and females with regards to planned careers (p<0.0001). Three times as many female students planned to pursue GPR/AEGD, seven times more males planned to pursue oral and maxillofacial surgery, and four times as many females planned a career in pediatric dentistry, while a similar number of males and females planned no additional training or the private practice of general dentistry (Figure 5).

Upon graduation, the greatest number of total respondents (24 percent) planned to enter a GPR/AEGD program. There was a rough tie for the second top plan among three options: entering private practice with no additional training, pursuing train-
ing in orthodontics, and “have not decided”—each at 16 percent. Less than 1 percent of the respondents reported that they would choose to immediately enter a career in academics. Oral pathology, oral and maxillofacial radiology, and dental public health were not selected by any of the respondents as a career plan, and the other specialties were selected by between 2 and 8 percent of the respondents.

The students were also asked to identify the single most important factor that impacted their
decision to choose a specialty or career path out of the following options: cost of program, enjoyment of providing that type of specialty care, exposure prior to dental school, faculty influence, future salary as a professional specialist, length of program, location of program, types of patients seen in that specialty of service, and other. The enjoyment of providing care in that field was reported as the single most important factor by half of the respondents. Faculty influence, location of the program, and cost of the program were reported as the least influencing factors to impact their decision in choosing a specialty or career path. No significant association could be established for the impact of class year, age group, gender, or debt on the single most important factor in choosing a specialty or career path.

Perceptions of Fields with Best Future

Students were also asked to give their perceptions regarding whether general dentistry, academics, and the nine ADA-recognized specialties had the best future in terms of salary, personal quality of life, patient quality of life, and overall impact on the profession. The nine ADA-recognized specialties were dental public health, endodontics, oral pathology, oral and maxillofacial radiology, oral and maxillofacial surgery, orthodontics, pediatric dentistry, periodontics, and prosthodontics.

General dentistry was believed to have the best future in terms of overall impact on the profession of dentistry by 50 percent of the respondents (Figure 6) followed by academics at 15 percent. More than one-third of students believed that general dentistry also had the best future in terms of patient quality of life (Figure 7). With regard to personal quality of life, orthodontics was believed to have the best future by 50 percent of the respondents (Figure 8), while general dentistry was ranked second at 22 percent. Oral and maxillofacial surgery was believed to have the best future in terms of salary by 34 percent of the respondents, closely followed by orthodontics at 30 percent (Figure 9). No association based on gender, age, class year, or expected accrued debt could be established regarding the respondents’ perceptions of dental specialties with the best future in terms of salary, personal quality of life, patient quality of life, and overall impact on the profession.

Discussion

Educational Debt

At the time of our study, the most recent ADEA survey of dental school seniors reported an average
educational debt on graduation of $170,000. This amount falls within the expected accrued debt of one-third of the students in our study, which was between $151,000 and $250,000.

According to a 1995 article by Douglass and Fein, in the 1980s and early 1990s, debt and increased levels of dental students’ indebtedness were reported to have very little effect on career choices.

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Figure 6. Respondents’ perceptions of the specialty or area with the best future in terms of overall impact on the profession of dentistry (410 total respondents in study)

Figure 7. Respondents’ perceptions of the specialty or area with the best future in terms of patient’s quality of life (410 total respondents in study)
However, these authors anticipated that increased levels of debt for dental students would discourage graduates from pursuing academic careers, research, or specialty training. Consistent with this prediction, students with the greatest amount of expected accrued debt in our study planned to pursue private practice in general dentistry or GPR/AEGD independent of class year, gender, or age group.

![Figure 8](image_url)

Figure 8. Respondents’ perceptions of the specialty or area with the best future in terms of personal quality of life (410 total respondents in study)

![Figure 9](image_url)

Figure 9. Respondents’ perceptions of the specialty or area with the best future in terms of salary (410 total respondents in study)
A qualitative study of dental students’ choice of professional career in the United Kingdom reported that many students were in debt upon graduation than they originally anticipated and were keen to start working right after graduation to start paying off their debt.9 A recent study of the influence of debt among medical students reported conflicting results.17 Similar to their counterparts in Canadian dental schools13 and medical students,17 the dental students who participated in our survey reported that debt was not the most significant factor in their career choices. It is only when we looked specifically at those students who expect higher accrued debt upon graduation that we find debt to be a highly influential factor, reflecting a difference in career plans between dental and medical students. Most dental students in our study and others’ planned to pursue training in GPR/AEGD or a private practice in general dentistry career, perhaps in an effort to pay off their debt right away.

The expectations of accrued debt were similar for respondents across all class years in our study, but when age was considered as a factor, those students in the twenty-five to twenty-nine years of age group (47 percent of the respondents) expected to accrue significantly more debt ($251,000 to $300,000). This is an interesting age group since it is comprised of students from diverse socioeconomic backgrounds. Some of them may have transitioned directly from college and made the decision to borrow the full allowable amount for tuition and living expenses without investing any personal funds. These students may also come from other professional training or careers with a more proactive view on their debt expectations and were probably planning to incur more than the actual amount of debt upon graduation.

The finding that the advanced standing students reported a more evenly distributed expected accrued debt may be related to the small sample size. Findings from other institutions could perhaps tell us more about the perceptions of this group of students’ expectations of debt upon graduation.

**Career Path and Influencing Factors**

The four-year curriculum at UPennSDM at the time of this study provided students with hands-on experience and training in the computerized simulation laboratory starting the first day of dental school. A great emphasis was placed in preclinical training during the first two years of dental school with full-time dedication to patient care for the last two years of the program. The advanced standing students joined the predoctoral classes as third- and fourth-year students. All students have the opportunity to work closely with and under the supervision of several faculty members, the majority of whom are general dentists.

A recent annual ADEA survey of U.S. dental seniors reported that 54 percent of graduates feel well prepared in preventive and restorative (general) dentistry.4 This general finding together with the hands-on experience and close clinical relationship between students and general dentists on the faculty may suggest that our curriculum is providing students with a well-rounded training as a general dentist. However, it may also suggest a false positive phase of feeling of security and comfort with a specific area of study. Another possible explanation may well be associated with a lack of exposure to the complex and multidisciplinary cases treated in a specialty as a result of either lack of exposure to a graduate program or lack of sufficient faculty members trained in the specialty. At the same time, it is important to emphasize that, with a large population of baby boomers and increased emphasis on improving not only function but also esthetics, the practice of dentistry now requires a special knowledge and experience with complex multidisciplinary treatments.

With most U.S. students feeling not prepared or least well prepared in specialized fields like prosthodontics, orthodontics, and oral and maxillofacial surgery4 together with most of the students in our study planning to pursue GPR/AEGD study and private practice in general dentistry careers, we think we are missing an opportunity to train our students in specialties for which there is a great need. An excellent example of this is the field of prosthodontics, where in 2002 Douglass and Watson predicted a significant shortage of prosthodontists over the next ten years.18 Our study found that only 2 percent of the 410 students planned to pursue a career in prosthodontics. Recently, Zarchy et al.15 reported that 85 percent of students at the Harvard School of Dental Medicine felt there was a greater need for prosthodontists in the future, but according to the ADEA survey of graduating dental students of 2008,4 only 18.7 percent felt well prepared in the specialty of prosthodontics.

Based on all these findings, we may wonder if there is a connection between what students think of
the future of a dental specialty and how well prepared they feel in that specialty upon graduation. The fact that none of the students who participated in our study planned a career in dental public health, oral and maxillofacial radiology, and oral pathology may be explained by factors such as inadequate exposure of students to a dental specialty, lack of faculty numbers or mentors in a specialized field who are available to work with the students, and lack of opportunities for students to treat patients who require care in those specialties.

Factors perceived to result in an increased applicant pool within a specialty have been recently explored in a ten-year survey by Munoz et al. of prosthodontics program directors. Although that survey focused on only one specialty, the factors it identified merit attention in light of our finding that few dental students in our study chose to pursue specialty training. Munoz et al. found that factors such as mentoring within a specialty, society’s demand for a higher level of training and credentialing, current data on projected income, exposure to specialty faculty at the predoctoral level, the dollar value of the specialty training, and advances in implant, esthetic, and reconstructive dentistry have all had some impact on increasing the pool of applicants to graduate programs in prosthodontics. Providing our dental students with exposure to these opportunities as part of their didactic and clinical curricula may increase their awareness and broaden their knowledge about and experience with the various dental specialties.

In our study, no significant association could be established between the fact that half of the students planned to pursue postdoctoral general dentistry training and not specialize and their class year, gender, age group, or expected accrued debt. A 2007 national survey of all dental students enrolled in Canadian dental schools reported a similar finding, with three-fourths of their students also planning to enter private practice in general dentistry. Our survey indicated that gender is a significant influencing factor in career choices with considerably more females than males planning careers in general dentistry practice and pediatric dentistry.

Our students reported that the factor that most impacted their decision to choose a specialty as a career path was the enjoyment of providing care in that field independent of class year, gender, age group, or debt. This is consistent with other reports that emphasize altruistic motives of why dental students have chosen dentistry as a career.

Perceptions of Fields with Best Future

In our study, the students at UPennSDM reported it was the belief of most of them that general dentistry will have the most future impact on the overall profession as well as on patient quality of life. Quality of life is often used to define the overall well-being of an individual or society. According to Gregory et al., physical and mental health, the environment, wealth, education, employment, social belonging, and leisure time are standard indicators of quality of life. In our study, we were unable to determine if this finding is associated with the fact that the majority of faculty members with whom students work are general dentists or if the curriculum does not provide enough clinical experience for students to treat patients in other specialties. Evaluation of these parameters among students in other institutions may shine more light on this finding.

The students in our study also believed that oral and maxillofacial surgery was the field with the best future in terms of salary, which is consistent with reports that this specialty was one of the highest paying jobs in the United States at the time of this survey as well as more recently. Orthodontics was selected by our respondents as the field with the second best future in terms of salary, which differs from the U.S. Department of Labor’s report that prosthodontics is the second highest paid dental specialty after oral and maxillofacial surgery. This discrepancy indicates that current data on salaries associated with the dental specialties may not be gaining the attention of dental students at UPennSDM.

The majority of students in our study also perceived orthodontics to have the best future in terms of personal quality of life. It is interesting to note that pediatric dentistry, prosthodontics, dental public health, and general dentistry—in all of which long-term, meaningful, and rewarding relationships between provider and patient are established—were ranked poorly in terms of personal quality of life. These findings point to the need to provide additional information about the actual practice of these specialties to our students.

This study has at least a couple of limitations. Although the sample size was large and included a diverse group of students, it represents students’ perceptions at only one U.S. dental school, and the findings may not be applicable to other institutions. Also, as this was a one-time survey, the students’
responses may have changed as they progressed through and graduated from dental school.

Conclusions

Most of the students in our study reported that enjoyment of providing the type of specialty care was the single most important factor when choosing a specialty training or career independent of age, gender, class year, or debt, but half of them planned to either pursue postdoctoral general dentistry training or enter the private practice of general dentistry upon graduation. Students ranked academics second as the field with the best future in term of the overall profession, but only 1 percent of them planned to enter academic careers immediately after graduation while 2 to 7 percent chose training in each of the specialty areas. We may be missing the opportunity to train our students in specialties in which students nationwide have reported feeling less prepared and where there is a shortage in specialty-trained dentists and faculty members. Establishment of mentoring programs, more clinical experience with specialty faculty members, and introductions to graduate residency programs during dental school may allow predoctoral dental students to assess if they enjoy providing care in a specialty and encourage them to consider those options.

The presence of students from various age groups in a class provides a variety of experiences for sharing. Returning to the classroom with experiences from other professional training or jobs, students in the older age groups may have a unique perspective on their motivation to pursue a dental education and perception of the dental specialties. To our knowledge, this is the first study to report demographics on advanced standing students. The University of Pennsylvania School of Dental Medicine has a well-established program for advanced standing students that accepts highly qualified individuals who have earned a dental degree in a foreign country and fully integrates them into the last two clinical years of training after an intensive summer program to review the didactic curriculum. These students’ integration into the study body promotes not only diversity and culture awareness but a variety of experiences among the students and the patient population in a large metropolitan city. While we know that the majority of our advanced standing students historically pursue the practice of general dentistry after graduation from our program, we have not yet started to explore their demographics. Further research on the students entering dentistry from other careers and other countries at all U.S. dental schools may provide more insight into their perceptions of dental specialties, as well as their motivations for pursuing a career in the field and the ways they enrich the educational experience for all students.

To our knowledge, this is the first study to establish a baseline of dental students’ perceptions of the dental fields with the best future in terms of personal and patient quality of life, salary, and overall impact on the profession. Conducting similar surveys of students at other institutions may provide the opportunity to learn more about their perceptions and career choices once they have made a decision to enter the field of dentistry. Also, collecting such information would give us more insight into how we can improve students’ experience and exposure to various dental specialties during their dental school training so we can identify further ways to increase their interest in pursuing specialty training at a time where dentistry is caring for an aging population with increased need for complex dental treatments.

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