

Career and Professional Satisfaction of Oral and Maxillofacial Surgery Residents, Academic Surgeons, and Private Practitioners: Does Gender Matter?

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Abstract: The aims of this study were to determine whether male vs. female oral and maxillofacial surgery (OMS) residents, academic surgeons (i.e., faculty members), and private practitioners in the U.S. differed in their general career satisfaction and job/professional satisfaction. Survey data were collected in 2011-12 from 267 OMS residents (response rate 55%), 271 OMS academic surgeons (response rate 31%), and 417 OMS private practitioners (response rates 13% web-based survey and 29% postal mail survey). The results showed that while the male vs. female OMS private practitioners and academic surgeons did not differ in their career satisfaction, the female residents had a lower career satisfaction than the male residents (on four-point scale with 4=most satisfied: 3.03 vs. 3.65; $p<0.01$). The male vs. female OMS private practitioners and academic surgeons also did not differ in their job satisfaction. However, the female residents agreed on average less that they were able to practice OMS in the way they want, felt less proud to be an oral and maxillofacial surgeon, were less satisfied with their career, and were more likely to consider a career change in the next five years than the male residents. While these male and female oral and maxillofacial surgeons in private practice and academia did not differ in their career and job satisfaction, the male and female residents differed significantly, with female residents reporting a significantly poorer career and job satisfaction than male residents. Future research needs to explore ways to improve career and professional satisfaction of female OMS residents.

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By 2010, the percentage of female dentists in the U.S. had risen from 0.3% in 1870 to 25.5%.¹ Given the increasing numbers of women in predoctoral dental programs, a further increase in the percentage of women dentists in the U.S. can be expected over the next years.² This trend in dentistry is paralleled in medicine where 32.6% of women were part of the active physicians workforce in the U.S. in 2013³ and nearly half of medical school graduates in the U.S. are currently female.^{4,5}

While the number of female medical residents rose by 25% between 1998 and 2007, a considerable gender difference in academic rank in U.S. medical schools was still documented in 2014.⁶ In addition,

gender equity is less likely to be found in certain dental and medical specialties. For example, in 2010, only 28,879 female practitioners (21%) were among the 135,780 surgeons in the U.S.,⁷ and in 2003, only 22-25% of graduates from U.S. surgical programs were female.⁸ While the percentage of incoming female medical residents increased significantly to 40% in 2006,⁹ it dropped again to 35% in 2010.¹⁰ The percentages of female residents in dental specialty programs and female practitioners also differ as a function of the particular specialty.¹¹⁻¹⁶ While 67% of oral medicine residents and 62% of pediatric dentistry residents were women in 2010-11, only 13% of oral and maxillofacial surgery (OMS) residents were female.¹⁷

OMS is a specialty in which the percentage of women has been traditionally lower than the percentage of women in dentistry and medicine overall. For example, in 1994, only 107 oral and maxillofacial surgeons in the U.S. were female,¹² and in 2003, only 154 of the 5,318 active OMS practitioners were women.¹³ In 2009, only 7% of the active workforce of OMS surgeons were women, and of the new OMS practitioners who had begun their careers between 2000 and 2009, only 13% were female.¹⁴ In 2015, only 422 of the 6,374 active members (6.6%) of the American Association of Oral and Maxillofacial Surgery (AAOMS) were female according to the AAOMS membership directory.¹⁵ These percentages of female oral and maxillofacial surgeons are not likely to increase, given the low percentages of female OMS residents and fellows in clinical OMS fellowship programs in the U.S. in the 2007-08 academic year and the lack of change over the next three years.^{16,17} Rostami et al. documented that the number of females entering OMS residency programs in 2010 had only increased by 2% since 1999.¹³

Given these gender differentials in dentistry and medicine overall and in different specialties, it is interesting to explore whether they are paralleled by differential levels of job satisfaction. In dentistry, research has found that more than 60% of general dentists in the U.S. had a high level of job satisfaction,¹⁸⁻²³ with some dental specialists such as pediatric dentists reporting exceptionally high levels of satisfaction.^{24,25} However, research on gender differences in dentists' job satisfaction is inconclusive. While some authors found significant differences in the job satisfaction of male and female dentists,^{23,26,27} others did not report any gender differences.^{18,20,28,29}

In medicine, one study found that the vast majority of female physicians were in general satisfied with their careers.³⁰ In 1999, Frank et al. reported that 84% of female physicians were usually, almost always, or always satisfied with their careers.³¹ However, 31% reported that they would maybe, probably, or definitely not choose to be a physician again, and 38% would maybe, probably, or definitely prefer to change their specialty. More recently, Keeton et al. reported that both women and men were highly satisfied with their careers (79% and 76% respectively) and that physician gender was not a strong independent predictor of career satisfaction, work-life balance, or burnout.³² However, Zuger found that female physicians were 60% more likely than their male counterparts to report burnout.³³ An extensive systematic review showed that physician satisfaction

was relatively stable, with small decreases primarily among primary care physicians.³⁴ While no gender differences in overall satisfaction were found in that review, the physicians work-life study did identify differences in satisfaction with specific aspects of physicians' professional lives.³⁰ For example, in that study, women were more satisfied with relationships with colleagues and patients but less satisfied with pay, resources, autonomy, and community relations compared to their male colleagues.

In surgery in particular, research in three European countries showed that one-third of residents reported job dissatisfaction, although no relationship between satisfaction and gender was found.³⁵ In the U.S., Gifford et al. found that female residents were more likely to consider leaving general surgery residency programs than were men.³⁶ As far as surgical specialists in the U.S. are concerned, male and female surgeons have differed in certain aspects of their job satisfaction. Another study reported, for example, that female surgeons were more likely to cite personal and professional networks as key to success and to note a lack of autonomy and clinical pressure as reasons for dissatisfaction.³⁷

One interesting question is how male and female OMS residents, academic surgeons, and private practitioners whose professional interests span dentistry and surgery differ in their career and professional/job satisfaction. The aims of this study therefore were to determine whether male vs. female OMS residents, academic surgeons, and private practitioners differed in their general career satisfaction and their more specific OMS-related professional/job satisfaction.

Methods

This cross-sectional study was determined to be exempt from oversight by the Institutional Review Board for the Behavioral and Health Sciences at the University of Michigan (#HUM 00040683). To obtain an overview of the percentages of women enrolled in U.S. advanced dental education programs in general and in OMS programs specifically as well as of the percentages of professionally active female dental specialists in the U.S. and specifically of female OMS private practitioners, a secondary analysis of data from American Dental Association (ADA) surveys was conducted.^{16,17}

In addition to the analysis of statistical information, survey data were collected in 2011-12 from

female and male OMS residents, female and male faculty members (called here “academic surgeons”) in OMS advanced dental specialty programs, and female and male OMS private practitioners across the U.S. Contact information for all groups was taken from the 2012 AAOMS directory.³⁸ General recruitment emails informed the potential respondents that the research was about OMS career and professional/job satisfaction without any reference to an interest in exploring the role of gender in this context. Any references to “gender differences” were carefully avoided to prevent a selection bias in the recruitment of respondents. The emails provided the respondents with a web link to an anonymous web-based survey. No follow-up emails were sent. In addition to sending recruitment emails to 1,000 randomly selected OMS private practitioners, paper surveys were sent by postal mail to another 1,000 randomly selected OMS private practitioners.

Section 1 of the survey asked about the respondents’ general and educational characteristics. Section 2 consisted of two standardized satisfaction surveys: the Professional Satisfaction Scale, published by Shugerman et al. in 2001,³⁹ and the Dentist Satisfaction Scale, developed by Shugars et al. in 1991 to focus on specific aspects of job satisfaction.¹⁸ Shugerman et al.’s global career satisfaction measure consists of four questions with yes/no answers. The first two questions ask respondents if they would choose dentistry and OMS again if starting over. The third and fourth questions ask whether they would recommend dentistry and OMS as a career to their child. A sum score of yes answers represents a measure of overall job satisfaction. Response to statements on the Dentist Satisfaction Scale were given on a five-point scale, ranging from 1=lowest to 5=highest satisfaction.

The data were downloaded from the website as an Excel file and imported into SPSS for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics such as frequency distributions, percentages, and means were computed to provide an overview of the responses. Inferential statistics were used to test for group differences. Specifically, chi-square tests were computed to compare the responses of male vs. female respondents in the three groups, and two-way univariate analyses of variance were used with the independent variables “Gender” and “Group (with three levels: residents, academic surgeons, private practitioners)” and the dependent variables career and professional/job satisfaction. A significance level of $p < 0.05$ was accepted.

Results

Table 1 shows the results of secondary analysis of statistical information published by the ADA concerning percentages of women enrolled in U.S. advanced dental education programs in 2007-08 and in 2010-11.^{16,17} This table also provides information about professionally active female practitioners in 2009, broken down by new practitioners who graduated in academic years 2000-09 versus all practitioners.¹⁴ While 67% of the residents in oral medicine and 62% in pediatric dentistry were women, the percentage of women enrolled in OMS programs was only 13% in both of the academic years considered.^{16,17} The percentage of professionally active female OMS practitioners who graduated between 2000 and 2009 was also 13%, while the percentage of active female OMS practitioners overall was only 7%. In comparison, 43% of professionally active practitioners in dental public health and 39% in pediatric dentistry were female, and the percentages of new practitioners in both fields were 55%.

Survey data were collected from 40 female and 227 male OMS residents (response rate 55%), 13 female and 158 male faculty members in OMS advanced programs (response rate 31%), and 25 female and 392 male OMS private practitioners (response rates 13% to the web-based survey [131 out of 1,000 invited] and 29% to the postal mail survey [286 out of 1,000 invited]). In each of these three groups, the number of female respondents was lower than the number of male respondents. However, a comparison of the percentages of female residents, academic surgeons, and private practitioners in the U.S. and in this sample showed that these two sets of percentages were relatively close for female residents and private practitioners, while female academic surgeons in our sample were slightly underrepresented compared to their representation among female academic surgeons in the U.S. overall.

Among the respondents, the female OMS residents were on average about two years younger than the male residents, and the female OMS academic surgeons and private practitioners were on average about seven years younger than their male counterparts (Table 2). The average dental school graduation years differed for female vs. male respondents in each of the three groups. However, the percentages of male vs. female respondents in each of the three groups who attended a four- vs. six-year program and who had a single vs. dual degree were not significantly dif-

Table 1. Percentages of women enrolled in U.S. advanced dental education programs in 2007-08 and 2010-11 and percentages of active female practitioners in specialties in 2009

Advanced Dental Education Program	% Women Enrolled in Academic Year			% Professionally Active Female Practitioners ^d	
	2007-08 ^a	2010-11 ^b	Rank ^c	2009: New ^e Practitioners	2009: All Practitioners
Oral medicine	67%	67%	1/1	N/A	N/A
Pediatric dentistry	62%	62%	2/3	55%	39%
Oral and maxillofacial radiology	61%	55%	3/5	0	22%
Dental public health	57%	53%	4/6	55%	43%
Oral and maxillofacial pathology	55%	64%	5/2	38%	22%
General practice residency	53%	55%	6/4	N/A	N/A
Combine prosthodontics-maxillofacial prosthetics	50%	50%	7/7	N/A	N/A
Maxillofacial prosthetics	46%	33%	8/12	N/A	N/A
Advanced education in general dentistry	43%	44%	9/8	N/A	N/A
Orthodontics and dentofacial orthopedics	38%	39%	10/9	32%	19%
Periodontics	37%	39%	11/10	33%	15%
Dental anesthesiology	36%	N/A	12/N/A	N/A	N/A
Prosthodontics	33%	35%	13/11	31%	16%
Endodontics	26%	32%	14/13	26%	18%
Clinical fellowship oral and maxillofacial surgery	14%	14%	15/14	N/A	N/A
Oral and maxillofacial surgery	13%	13%	16/15	13%	7%

^aAmerican Dental Association. 2007-08 survey of advanced dental education. Chicago: American Dental Association, 2009.

^bAmerican Dental Association. 2010-11 survey of advanced dental education. At: www.ada.org/~media/ADA/Member%20Center/Files/survey_advanced_ed.ashx. Accessed 21 Sept. 2015.

^cThe ranks were added by the authors.

^dAmerican Dental Association. Workforce distribution of dentists in the United States by region and state, 2009. At: www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/09_dod.ashx. Accessed 21 Sept. 2015. This report provides frequencies of dentists in these groups. The authors then computed percentages of new and overall active practitioners in secondary analysis of the data.

^eNew practitioners are graduates of academic years 2000-09.

ferent. While no significant gender differences were found concerning how the respondents financed their education, the residents reported significantly higher average debt levels than the academic surgeons and private practitioners.

Table 3 provides an overview of the overall job satisfaction of the responding female vs. male OMS residents, academic surgeons, and private practitioners. An analysis of responses to the four items of the Professional Satisfaction Scale³⁹ showed that the responses of female vs. male academic surgeons and private practitioners did not differ significantly. However, the analysis of variance results with the dependent variable “sum of yes” responses showed that the interaction effect between “Gender” x “Respondent group” was significant. Female residents had the lowest and male residents the highest average career satisfaction sum score (on a scale from 0 to 4: 3.03 vs. 3.65). Post hoc comparisons of the male vs. female respondents in each group showed that the female residents had significantly lower job satisfaction than the male residents ($p < 0.01$), while the male vs. female academic surgeons and the male vs. female

private practitioners did not differ in their career satisfaction. Comparisons of the percentages of “yes” responses of the male vs. female respondents to each of the four questions showed that 90% of the male residents would choose dentistry again vs. only 74% of the female residents ($p < 0.05$) and that 97% of the male residents would choose OMS again compared to only 85% of the female residents ($p < 0.01$). In addition, 90% of the male residents would recommend dentistry to their child compared to 80% of the female residents ($p < 0.05$), and 86% of the male residents would recommend OMS to their child compared to 65% of the female residents ($p < 0.01$).

In addition to measuring overall career satisfaction, the professional satisfaction scale developed by Shugars et al.¹⁸ was included in the survey. A factor analysis (extraction method: principal component analysis; rotation method: Varimax with Kaiser Normalization) was conducted to identify the underlying factor structure of these responses. The results showed that the items loaded on seven factors. The responses to the items loading on each factor were averaged to create indices. Cronbach’s alpha coef-

Table 2. Overview of respondents' characteristics

Characteristic	OMS Residents		OMS Academic Surgeons		OMS Private Practitioners	
	Female N=40	Male N=227	Female N=13	Male N=158	Female N=25	Male N=392
Percentage in U.S.	13%	87%	16.5%	83.5%	7%	93%
Percentage in sample	15%	85%	8%	92%	6%	94%
Age	N=40	N=224	N=13	N=158	N=25	N=391
Mean (SD)	29 (2.07)	31** (2.66)	47 (8.18)	54* (10.27)	44 (8.10)	51*** (11.64)
Education						
Year of graduation from dental school: Mean	N=35 2008	N=173 2007*	N=11 1990	N=135 1982*	N=25 1993	N=370 1985***
Year of graduation from OMS: Mean	N=38 2013	N=212 2012	N=13 1996	N=154 1987**	N=25 1999	N=377 1991***
OMS program was a	N=34	N=197	N=12	N=121	N=21	N=299
4-year program	38%	28%	25%	34%	48%	47%
6-year program	62%	72%	75%	66%	52%	53%
Type of degree	N=38	N=224	N=11	M=106	N=24	N=272
Single degree	42%	40%	55%	54%	63%	63%
Dual degree	58%	60%	45%	46%	37%	37%
Financial support	N=39	N=225	N=13	N=155	N=25	N=386
Loans	77%	77%	77%	48%	44%	37%
Scholarship	8%	6%	8%	14%	24%	19%
Personal savings	3%	7%	15%	21%	20%	36%
Family assistance	5%	5%	0	10%	8%	4%
Other	7%	5%	0	7%	4%	4%
Overall debt	N=38 2.4	N=227 2.6	N=13 1.3	N=153 1.3	N=25 1.8	N=380 1.5

Note: Overall debt was assessed as 1= \leq 100K; 2=101-200K; 3=201-300K; 4=301-400K; 5= $>$ 400K.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

ficients were then computed to assess whether the inter-item consistency of these seven subscales were sufficient to justify the use of these indices. All the Cronbach's alphas were above 0.60 (Table 4).

The results of univariate analyses of variance with the independent variable "Respondent group" showed that the three groups of respondents differed in their responses to six of the seven indices (Table 4). Private practitioners were overall most satisfied and OMS residents were least satisfied with their income (private practitioners 3.76 vs. academic surgeons 3.10 vs. OMS residents 2.80; $p < 0.001$). The same trends were found in the overall positive satisfaction with their profession (4.28 vs. 4.21 vs. 4.07; $p < 0.01$) and with patient relations (4.45 vs. 4.33 vs. 4.17; $p < 0.001$). However, the academic surgeons were least satisfied with the business aspect of their profession and most satisfied with their professional skills.

Table 5 shows the average specific itemized satisfaction responses as well as the mean indices

of male vs. female respondents overall. Concerning responses to individual items, there were significant gender differences in responses to seven of the 30 items on this standardized scale. The male respondents were consistently more satisfied than the female respondents in each of the seven significant differences, with the exception of responses to the item "I have very little time to keep abreast of advances." On this item, the female respondents were more satisfied than the male respondents. Concerning gender differences, the male vs. female respondents overall only differed on one of the seven indices. The male respondents were more satisfied with their professional skills than the female respondents (3.85 vs. 3.62; $p < 0.01$).

Table 6 provides an overview of responses of the male vs. female OMS residents, academic surgeons, and private practitioners to each of the 30 individual items as well as the seven indices. Not one interaction effect was significant when two-way

Table 3. Career satisfaction of participating female vs. male OMS residents, academic surgeons, and private practitioners

	OMS Residents		OMS Academic Surgeons		OMS Private Practitioners		p-value (groups)
	Female % Yes	Male % Yes	Female % Yes	Male % Yes	Female % Yes	Male % Yes	
Dentist Satisfaction Survey							
If starting over, would you:							
Choose dentistry again?	N=29 74%	N=206 90%*	N=11 85%	N=120 78%	N=20 83%	N=324 87%	*
Recommend dentistry to your child?	N=31 80%	N=206 90%*	N=10 77%	N=115 74%	N=19 79%	N=312 84%	***
Satisfaction with OMS							
Choose OMS as your specialty?	N=34 85%	N=222 97%**	N=12 92%	N=141 90%	N=21 88%	N=348 94%	n.s.
Recommend OMS to your child?	N=26 65%	N=194 86%**	N=11 85%	N=119 77%	N=19 83%	N=312 85%	n.s.
Global Satisfaction Score: Mean (SD)	3.03 (1.11)	3.65** (0.76)	3.38 (0.96)	3.19 (1.18)	3.45 (1.01)	3.48 (1.02)	p-value (group x gender)*

Note: The Dentist Satisfaction Survey is from Shugerman R, Linzer M, Nelson K, et al. Pediatric generalists and subspecialists: determinants of career satisfaction. *Pediatrics* 2001;108(3):E40. The Global Satisfaction Score was computed by adding one point for each of the four questions answered “yes”; accordingly, higher scores reflect higher satisfaction.

*p<0.05; **p<0.01; ***p<0.001

univariate analyses of variance for the seven indices and two-way multivariate analyses of variance for the seven groups of individual items were computed. However, given the career satisfaction results that showed that the male vs. female residents’ satisfaction was significantly different, independent sample t-tests were used to compare the average responses of the male vs. female OMS residents to see if these professional satisfaction responses mirrored the career satisfaction responses. The female residents had on average significantly lower positive satisfaction scores and significantly higher negative satisfaction scores than the male residents. The female residents were significantly more likely to agree with statements such as “Oral surgery is a very stressful profession,” “I appear more satisfied with my job than I really am,” “I am very likely to change career in the next 5 years,” and “I feel trapped in my current position” than the male residents. On the other hand, the male residents agreed more strongly with such statements as “Oral surgery fulfills my career aspirations,” “I am able to practice oral surgery the way I want to,” “I feel quite proud to be an oral surgeon,” and “Overall, I am extremely satisfied with my career” than the female residents.

Discussion

Before we discuss the results concerning career and professional satisfaction of the participating OMS residents, academic surgeons, and private practitioners, it is interesting to consider the gender-related professional situation in which residents receive their training and private practitioners spend their professional lives. The analysis of published statistical information concerning the percentages of men and women in advanced dental education programs in academic years 2007-08 and 2010-11 showed that only about one in ten OMS residents was female in those two years.^{16,17} Given the small cohort size of OMS residency classes, this finding implies that women tend to be solo persons in OMS residency programs and will not be likely to find female mentors among their teaching academic surgeons in many instances. The question arises how this situation affects the climate for female residents and their chances to find supportive mentors for their careers.

In addition, this significant gender difference was found for men and women in clinical OMS fellowship programs, which are programs for private practitioners who want to practice in a subspecialty. The fact that the percentages of female OMS resi-

Table 4. Average job/professional satisfaction responses of three groups of respondents

Statement	OMS Residents	OMS Academic Surgeons	OMS Private Practitioners
My income compares favorably to that of other professionals.	3.32	3.30	3.94**
I am very pleased with my income compared to other oral surgeons.	2.57	2.83	3.57**
The income that I receive from my practice is most satisfactory for my needs.	2.65	3.20	3.86**
My total earnings are much lower than I desire.	2.68	3.05	3.65**
<i>Index: income-related satisfaction (Cronbach's alpha=0.886)</i>	2.80	3.10	3.76**
Oral surgery is a very stressful profession.	3.23	3.42	3.51
I wish I could drop my job to do something else.	1.59	1.82	1.72
I appear more satisfied with my job than I really am.	2.43	2.53	2.38
I am very likely to change careers in the next 5 years.	1.23	1.56	1.41
I feel trapped in my current position.	2.08	1.99	1.91
<i>Index: overall satisfaction (Cronbach's alpha=0.742)</i>	2.44	2.58	2.48
Oral surgery fulfills my career aspirations.	4.32	4.35	4.40
I am able to practice oral surgery the way I want to.	3.60	4.00	4.14**
I feel quite proud to be an oral surgeon.	4.44	4.40	4.54
Oral surgery is the place where I can make my best contribution.	3.84	4.08	4.03
Overall, I am extremely satisfied with my career.	4.18	4.23	4.26
<i>Index: overall positive satisfaction (Cronbach's alpha=0.788)</i>	4.07	4.21	4.28*
I do not enjoy interacting with my patients. (recoded)	4.32	4.40	4.34
I enjoy helping my patients.	4.49	4.60	4.67
The quality of interpersonal care I provide is very high.	3.90	4.25	4.35**
I find my relationships with patients satisfying.	4.03	4.34	4.32**
<i>Index: patient relations (Cronbach's alpha=0.653)</i>	4.17	4.33	4.45**
I manage the business aspects of the office very well.	2.86	2.86	3.34**
I enjoy the business side of my practice.	2.79	2.28	2.74
I manage the business aspects of my job quite well.	2.97	3.04	3.40*
<i>Index: practice business (Cronbach's alpha=0.816)</i>	2.87	2.73	3.16*
I have very limited time for professional contacts with colleagues. (recoded)	3.29	3.68	3.55*
I do not get the respect I deserve. (recoded)	3.35	3.87	3.84*
I have high-quality specialists to whom I can refer patients.	3.58	4.12	4.05**
I have sufficient time for professional contacts with colleagues.	3.17	3.48	3.54**
<i>Index: professional contacts (Cronbach's alpha=0.624)</i>	3.35	3.79	3.75**
I have very little time to keep abreast of advances. (recoded)	3.15	3.67	3.70**
I do not have enough time to improve my clinical skills. (recoded)	3.56	4.07	3.90**
I am skilled at dealing with my patients' surgical problems.	4.01	4.64	4.55**
I have been able to incorporate into my practice the technological changes occurring in oral surgery.	3.22	3.71	3.78**
<i>Index: professional skills (Cronbach's alpha=0.606)</i>	3.48	4.02	3.98**

Note: Question was worded: How much do you agree with the following statements? Response options ranged from 1=disagree strongly to 5=agree strongly.

*p<0.01; **p<0.001

dents and fellows were by far the lowest percentages compared to the percentages in all other advanced dental education programs deserves attention because it may point to the fact that no gender progress has been made in this specialty over the past years. In addition, comparing the percentages of female residents in OMS with the percentages of female residents in

two related surgical fields (otolaryngology and plastic surgery) is quite eye-opening. Davis et al. found that the percentages of female residents entering otolaryngology increased from 19% in 2000-01 to 30% in 2005-06 and the percentage of female residents in plastic surgery fluctuated between 21% and 24% in that time span.⁹ That comparison therefore showed

Table 5. Average job/professional satisfaction responses of male vs. female respondents

Statement	Male	Female	p-value
My income compares favorably to that of other professionals.	3.55	3.29	0.094
I am very pleased with my income compared to other oral surgeons.	3.02	2.71	0.047
The income that I receive from my practice is most satisfactory for my needs.	3.27	2.95	0.035
My total earnings are much lower than I desire. (recode)	3.13	3.00	0.422
<i>Index: income-related satisfaction (Cronbach's alpha=0.886)</i>	3.24	2.99	0.052
Oral surgery is a very stressful profession.	3.38	3.39	0.949
I wish I could drop my job to do something else.	1.69	1.86	0.231
I appear more satisfied with my job than I really am.	2.42	2.63	0.181
I am very likely to change careers in the next 5 years.	1.39	1.43	0.779
I feel trapped in my current position.	1.98	2.13	0.307
<i>Index: overall satisfaction (Cronbach's alpha=0.742)</i>	2.48	2.60	0.312
Oral surgery fulfills my career aspirations.	4.37	4.27	0.357
I am able to practice oral surgery the way I want to.	3.94	3.69	0.049
I feel quite proud to be an oral surgeon.	4.47	4.39	0.368
Oral surgery is the place where I can make my best contribution.	3.99	3.90	0.534
Overall, I am extremely satisfied with my career.	4.26	3.97	0.012
<i>Index: overall positive satisfaction (Cronbach's alpha=0.788)</i>	4.21	4.05	0.062
I do not enjoy interacting with my patients.	4.35	4.31	0.764
I do not get the respect I deserve. (recoded)	4.35	4.3	0.605
I enjoy helping my patients.	4.59	4.59	0.992
The quality of interpersonal care I provide is very high.	4.17	4.12	0.561
I find my relationships with patients satisfying.	4.24	4.16	0.419
<i>Index: patient relations (Cronbach's alpha=0.708)</i>	4.35	4.31	0.605
I manage the business aspects of the office very well.	3.04	2.76	0.045
I enjoy the business side of my practice.	2.62	2.44	0.262
I manage the business aspects of my job quite well.	3.16	2.92	0.078
<i>Index: practice business (Cronbach's alpha=0.816)</i>	2.94	2.71	0.060
I have very little time to keep abreast of advances. (recoded)	3.51	3.51	0.955
I do not have enough time to improve my clinical skills. (recoded)	3.69	3.71	0.890
I have high-quality specialists to whom I can refer patients.	3.92	3.86	0.630
I have sufficient time for professional contacts with colleagues.	3.41	3.30	0.405
<i>Index: professional contacts (Cronbach's alpha=0.624)</i>	3.63	3.59	0.668
I have very little time to keep abreast of advances.	3.54	3.15	0.008
I do not have enough time to improve my clinical skills.	3.86	3.75	0.434
I am skilled at dealing with my patients' surgical problems.	4.42	4.20	0.019
I have been able to incorporate into my practice the technological changes occurring in oral surgery.	3.59	3.36	0.078
<i>Index: professional skills (Cronbach's alpha=0.606)</i>	3.85	3.62	0.005

Note: Question was worded: How much do you agree with the following statements? Response options ranged from 1=disagree strongly to 5=agree strongly.

that higher percentages of female residents entered related surgical fields, while the OMS data showed that in 2010 the number of female OMS residents had only increased by 2% since 1999.¹³ It is therefore not surprising that the percentage of new OMS practitioners in the U.S. was also only 13% (Table 1).¹⁴ While this percentage was clearly higher than the 7% of active female OMS practitioners overall, it is nevertheless small and not likely to increase

given the current number of female OMS residents. We therefore agree with Rostami et al. who stated that the field of OMS is male-dominated.¹³

Given these statistics, it is not surprising that the numbers of female respondents in our study were smaller than the numbers of male respondents in each of the three groups. Future research needs to focus on assessing the situation of female OMS residents, academic surgeons, and private practitioners by

Table 6. Job/professional satisfaction of participating female vs. male OMS residents, academic surgeons, and private practitioners

Statement	OMS Residents		OMS Academic Surgeons		OMS Private Practitioners	
	Female N=40	Male N=227	Female N=13	Male N=158	Female N=25	Male N=392
My income compares favorably to that of other professionals.	2.92	3.39	3.00	3.33	3.96	3.94
I am very pleased with my income compared to other oral surgeons.	2.35	2.60	2.23	2.88	3.56	3.57
The income that I receive from my practice is most satisfactory for my needs.	2.38	2.69	2.69	3.25	3.76	3.86
My total earnings are much lower than I desire. (recode)	2.38	2.68	2.92	3.06	3.68	3.65
<i>Index: income-related satisfaction</i>	2.51	2.84	3.13	2.71	3.74	3.76
Oral surgery is a very stressful profession.	3.50	3.18	3.33	3.43	3.33	3.52
		p<0.05				
I wish I could drop my job to do something else.	1.83	1.55	1.83	1.82	1.92	1.71
I appear more satisfied with my job than I really am.	2.80	2.37	2.67	2.52	2.42	2.38
		p<0.05				
I am very likely to change careers in the next 5 years.	1.57	1.18	1.25	1.59	1.47	1.40
		p<0.05				
I feel trapped in my current position.	2.40	2.03	1.92	1.99	2.08	1.90
		p<0.05				
<i>Index: overall satisfaction</i>	2.82	2.38	2.44	2.59	2.54	2.49
		p<0.01				
Oral surgery fulfills my career aspirations.	4.15	4.35	4.23	4.36	4.44	4.40
I am able to practice oral surgery the way I want to.	3.26	3.65	3.62	4.03	4.20	4.14
		p<0.01				
I feel quite proud to be an oral surgeon.	4.18	4.48	4.46	4.39	4.52	4.54
		p<0.05				
Oral surgery is the place where I can make my best contribution.	3.82	3.84	3.77	4.11	4.12	4.03
Overall, I am extremely satisfied with my career.	3.82	4.24	3.92	4.26	4.16	4.27
		p<0.01				
<i>Index: overall positive satisfaction</i>	3.85	4.11	4.00	4.23	4.29	4.27
		p<0.05				
I do not enjoy interacting with my patients.	2.27	4.32	4.31	4.40	4.38	4.34
I do not get the respect I deserve. (recoded)	4.16	4.22	4.29	4.41	4.48	4.41
I enjoy helping my patients.	4.63	4.47	4.54	4.61	4.58	4.68
The quality of interpersonal care I provide is very high.	3.77	3.92	4.08	4.26	4.50	4.34
I find my relationships with patients satisfying.	3.90	4.05	4.08	4.36	4.50	4.31
<i>Index: patient relations</i>	4.16	4.22	4.29	4.41	4.48	4.41
I manage the business aspects of the office very well.	2.64	2.89	2.45	2.89	3.18	3.35
I enjoy the business side of my practice.	2.60	2.82	2.18	2.29	2.55	2.75
I manage the business aspects of my job quite well.	2.84	2.99	2.64	3.07	3.27	3.41
<i>Index: practice business (Cronbach's alpha=0.816)</i>	2.69	2.90	2.42	2.75	3.00	3.17
I have very little time to keep abreast of advances. (recoded)	3.15	3.31	3.54	3.69	3.83	3.54
I do not have enough time to improve my clinical skills. (recoded)	3.31	3.36	4.08	3.85	3.74	3.85
I have high-quality specialists to whom I can refer patients	3.54	3.58	4.15	4.11	3.87	4.06
I have sufficient time for professional contacts with colleagues.	2.96	3.20	3.15	3.51	3.78	3.52
<i>Index: professional contacts</i>	3.24	3.36	3.73	3.79	3.80	3.74
I have very little time to keep abreast of advances.	2.92	3.31	2.85	3.69	3.67	3.54
I do not have enough time to improve my clinical skills.	3.33	3.59	4.00	4.07	3.91	3.89
I am skilled at dealing with my patients' surgical problems.	3.74	4.05	4.54	4.65	4.33	4.57
I have been able to incorporate into my practice the technological changes occurring in oral surgery.	3.19	3.22	3.15	3.75	3.75	3.78
<i>Index: professional skills</i>	3.30	3.51	3.64	4.06	3.91	3.99

Note: Question was worded: How much do you agree with the following statements? Response options ranged from 1=disagree strongly to 5=agree strongly.

using focus groups and in-depth interviews to gain a better understanding of the climate that females face in OMS programs and how it could be improved.

After reflecting on the situation that female OMS residents, academic surgeons, and private practitioners face in their profession, we also find it interesting to discuss the career and professional satisfaction-related results of this survey. While research in dentistry¹⁸⁻²⁶ and in medicine^{30-34,36} has been rather inconclusive concerning whether there were gender differences in job satisfaction, a striking difference in the career satisfaction of male vs. female OMS residents was found in our study. The female residents were overall significantly less satisfied with their career than were their male colleagues and also were specifically less satisfied with their role in OMS. These findings might be related to results published by Rostami et al. who reported in 2010 that 60% of female OMS residents and private practitioners perceived a continuing bias against women in their field.¹³ This perception was shared by male OMS practitioners, residents, and program directors surveyed by Rostami and Laskin.⁴⁰ This finding in combination with research in dentistry that documented female dental educators were more likely than their male colleagues to perceive a gender bias in dental school environments⁴¹ might explain why the increasing numbers of female dental students do not translate into increasing numbers of applicants to OMS residency programs. Studies reporting that male OMS program directors did not show a bias against women applicants¹³ and that they had a favorable view of women⁴² are definitely encouraging in this situation.

In addition to significant gender differences between the male and female OMS residents' career satisfaction, we also found significantly lower positive professional satisfaction scores of the female residents compared to the male residents and significantly higher negative satisfaction scores of the female vs. male residents. The statistical evidence showing a lack of progress in increasing numbers of females in OMS residency programs and therefore the profession at large, plus the strong evidence of a low percentage of female residents entering OMS programs, has to be taken seriously. The fact that the OMS profession is aware of these issues is reflected in a discussion initiated by an article discussing the role of women in academic OMS.⁴³ This author stated that one explanation for this situation is the shortage of female role models in academia. However, he also suggested that women in OMS might not choose

academia because private practice offers them a greater opportunity than academia for adaptation to "the desire of some women to eventually raise a family." In response to that article, Yeung countered that the factors having a negative effect on female oral surgeons' decision to go into academia are salary differences between academia and private practice, negative attitudes unrelated to gender, and the fact that women are underrepresented in oral surgery.⁴⁴ In addition, Stavropoulos pointed out that multiple studies have shown that gender bias is still experienced by OMS residents and practitioners and discussed that gender discrimination, lack of role models in dental schools, the length of OMS training, debt, and social issues are still major factors that discourage women dentists from pursuing careers in OMS.⁴⁵ Freedberg argued that the low numbers of female OMS residents are an indication of bias against women because larger percentages of female residents are found in other surgical specialties.⁴⁶ Finally, Delsol stated that the critical element for every dental professional to decide whether to pursue an academic career in oral surgery is the presence of equal opportunities and acknowledged there are multiple reasons for those who do not make this choice.⁴⁷ While this debate concerning the admission of female residents into OMS programs and then their recruitment into academic careers is quite encouraging, less encouraging are data that show there are still gender differences in achieving promotion and tenure in academic institutions and especially in dentistry⁴⁸ and medicine.⁴⁹ More research is urgently needed to identify the causes of this situation.

This study had three main limitations. First, it focused on the situation in the U.S., and no generalizations are possible to other countries. However, future comparative research might allow gaining a better understanding of the reasons why the percentages of female OMS residents and academicians as well as private practitioners do not seem to improve. Second, the response rates to this survey and the absolute numbers of women were low. For example, while the academic surgeons' response rate was 31%, only 13 women academic surgeons responded. Hardigan et al.'s research showing that response rates to web-based surveys are on average 11% and to postal mail surveys 26% suggests we should be less concerned about receiving responses from 31% of the academic surgeons contacted for the web-based survey.⁵⁰ However, the absolute numbers of female responses indicate that future research with larger numbers of women is strongly needed. One final

limitation is that the numbers of respondents were too small to make subgroup comparisons such as, for example, comparisons between residents in the different years of residency programs. Such comparisons could have been quite informative and should be targeted in future research.

Conclusion

It is obvious from the analysis of published statistical information that the percentage of female OMS residents has not been increasing substantially in the U.S. over the past decade. Furthermore, while the career satisfaction of participating female and male OMS academic surgeons and private practitioners was not found to be significantly different, significant gender differences in the career satisfaction of the OMS residents were found. The female OMS residents had significantly less positive career satisfaction overall than the male residents. In addition, the female residents were significantly less positive in aspects of their overall professional satisfaction than their male counterparts.

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REFERENCES

1. U.S. Census Bureau. Number and percentage of dentists by sex, 1870-2010. Washington, DC: U.S. Census Bureau, 2014.
2. Feldman C. Attaining and sustaining leadership for U.S. women in dentistry. *J Dent Educ* 2015;79(5 Suppl):S13-7.
3. Association of American Medical Colleges. 2014 physician specialty data book, 2014. At: www.aamc.org/databook/2014. Accessed 21 Sept. 2015.
4. Barzansky B, Etzel S. Medical schools in the United States, 2013-14. *JAMA* 2014;312(22):2419-26.
5. Association of American Medical Colleges. Women in U.S. academic medicine: statistics and benchmarking report, 2008-09. At: www.aamc.org/download/53502/data/wimstatisticsreport2009.pdf. Accessed 21 Sept. 2015.
6. Jena AB, Khullar D, Ho O, et al. Sex differences in academic rank in U.S. medical schools in 2014. *JAMA* 2015;314(11):1149-58.
7. American College of Surgeons, Health Policy Research Institute. Surgical workforce in the U.S. Chicago: American College of Surgeons, 2010.
8. McCord JH, McDonald R, Levenson G, et al. Motivation to pursue surgical subspecialty training: is there a gender difference? *J Am Coll Surg* 2007;205(5):698-703.
9. Davis EC, Risucci DA, Blair PG, Sachdeva AK. Women in surgery residency programs: evolving trends from a national perspective. *J Am Coll Surg* 2011;212(3):320-6.
10. Cochran A, Hauschild T, Elder WB, et al. Perceived gender-based barriers to careers in academic surgery. *Am J Surg* 2013;206(2):263-8.
11. Woolfolk MW, Price SS. Dental education: evolving student trends. *J Dent Educ* 2012;76(1):51-64.
12. Risser MJ, Laskin DM. Women in oral and maxillofacial surgery: factors affecting career choices, attitudes, and practice characteristics. *J Oral Maxillofac Surg* 1996;54(6):753-7.
13. Rostami F, Ahmed A, Best A, Laskin DM. The changing personal and professional characteristics of women in oral and maxillofacial surgery. *J Oral Maxillofac Surg* 2010;68(2):381-5.
14. American Dental Association. Workforce distribution of dentists in the United States by region and state, 2009. At: www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/09_dod.ashx. Accessed 5 Feb. 2016.
15. American Association of Oral and Maxillofacial Surgery. Membership directory. Rosemont, IL: American Association of Oral and Maxillofacial Surgery, 2015.
16. American Dental Association. 2007-08 survey of advanced dental education. Chicago: American Dental Association, 2009.
17. American Dental Association. 2010-11 survey of advanced dental education. 2012. At: www.ada.org/~media/ADA/Member%20Center/Files/survey_advanced_ed.ashx. Accessed 21 Sept. 2015.
18. Shugars DA, Hays RD, DiMatteo MR, Cretin S. Development of an instrument to measure job satisfaction among dentists. *Med Care* 1991;29(8):728-44.
19. Logan HL, Muller PJ, Berst MR, Yeane DW. Contributors to dentists' job satisfaction and quality of life. *J Am Coll Dent* 1997;64:39-43.
20. Gunn SM, Woolfolk M, Maxson B. Dentists' satisfaction and attitudes on the future. *J Am Coll Dent* 1990;57:12-5.
21. Yablon P, Maykow KP. Nonchairside factors affecting the career satisfaction of dentists. *J Dent Pract Admin* 1984;1:42-6.
22. Gorter RC, Storm MK, Brake H, et al. Outcome of career expectancies and early professional burnout among newly qualified dentists. *Int Dent J* 2007;57:279-85.
23. Ayers K, Thomson WM, Rich AM, Newton JT. Gender differences in dentists' working practices and job satisfaction. *J Dent* 2008;36:343-50.
24. Needleman HL, Bang S, Zhou J, et al. Personality types of pediatric dentists: comparative analysis and associated factors. *Pediatr Dent* 2011;33:37-45.
25. Bates LF, Buehler AM, Boynton JR, et al. Pediatric dentists' job satisfaction: results of a national survey. *Pediatr Dent* 2013;35(4):343-50.
26. Wells A, Winter PA. Influence of practice and personal characteristics of dental job satisfaction. *J Dent Educ* 1999;63(8):805-12.
27. Luzzi L, Spencer AJ. Job satisfaction of the oral health labor force in Australia. *Aust Dent J* 2011;56:23-32.
28. McQuistan MR, Kuthy RA, Maminano PC, Ward MM. General dentists' referrals of 3- to 5-year-old children to pediatric dentists. *J Am Dent Assoc* 2006;137:653-60.
29. Sur H, Hayran O, Mumcu G, et al. Factors affecting dental job satisfaction: a cross-sectional survey in Turkey. *Eval Health Prof* 2004;27:152-64.

30. McMurray JE, Linzer M, Konrad TR, et al. The work lives of women physicians: results from the physician work-life study. *J Gen Intern Med* 2000;15(6):372-80.
31. Frank E, McMurray JE, Linzer M, Elon L. Career satisfaction of women physicians: results from the women physicians' health study. *Arch Intern Med* 1999;159(13):1417-26.
32. Keeton K, Fenner DE, Johnson TR, Hayward RA. Predictors of physician career satisfaction, work-life balance, and burnout. *Obstet Gynecol* 2007;109(4):949-55.
33. Zuger A. Dissatisfaction with medical practice. *N Engl J Med* 2004;350:69-77.
34. Scheurer D, McKean S, Miller J, Wetterneck T. U.S. physician satisfaction: a systematic review. *J Hosp Med* 2009;4(9):560-8.
35. Von Websky MW, Oberkofler CE, Rufibach K, et al. Trainee satisfaction in surgery residency programs: modern management tools ensure trainee motivation and success. *Surgery* 2012;152(5):794-801.
36. Gifford E, Galante J, Kaji AH, et al. Factors associated with general surgery residents' desire to leave residency programs: a multi-institutional study. *JAMA Surg* 2014;149(9):948-53.
37. Deshpande SP, Deshpande SS. Career satisfaction of surgical specialties. *Ann Surg* 2011;235(5):1011-6.
38. American Association of Oral and Maxillofacial Surgery. Membership directory. Rosemont, IL: American Association of Oral and Maxillofacial Surgery, 2012.
39. Shugerman R, Linzer M, Nelson K, et al. Pediatric generalists and subspecialists: determinants of career satisfaction. *Pediatrics* 2001;108(3):E40.
40. Rostami F, Laskin DM. Male perceptions of women in oral and maxillofacial surgery. *J Oral Maxillofac Surg* 2014;72(12):2383-5.
41. Nesbitt PE, Inglehart MR, Sinkford JC. Work environment perceptions of full-time dental educators: does gender matter? *J Dent Educ* 2004;67(8):916-24.
42. Brunner B, Campbell JH. Student and program director perceptions of oral and maxillofacial surgery as career for women. *N Y State Dent J* 2010;76(4):40-4.
43. Laskin DM. The role of women in academic oral and maxillofacial surgery. *J Oral Maxillofac Surg* 2015;73(4):579.
44. Yeung AY. Letters to the editor regarding Dr. Laskin's perspectives article. *J Oral Maxillofac Surg* 2015;73(6):1025-6.
45. Stavropoulos F. Re: Dr. Laskin's perspective. *J Oral Maxillofac Surg* 2015;73(6):1024-5.
46. Freedberg M. Re: the role of women in academic oral and maxillofacial surgery. *J Oral Maxillofac Surg* 2015;73(6):1025.
47. Delsol M. Female oral and maxillofacial surgeons' career choices. *J Oral Maxillofac Surg* 2015;73(6):1025.
48. Ioannidou E, D'Souza RN, MacDougall MJ. Gender equity in dental academics: gains and unmet challenges. *J Dent Res* 2014;93(1):5-7.
49. Sege R, Nykiel-Bub L, Selk S. Sex differences in institutional support for junior biomedical researchers. *JAMA* 2015;4(11):1175-7.
50. Hardigan PC, Succar CT, Fleisher JM. An analysis of response rate and economic costs between mail and web-based surveys among practicing dentists: a randomized trial. *J Community Health* 2012;37(2):383-94.