Gender Diversity in Practice Patterns Among Male and Female Dentists

Margaret Langelier, MSHSA, Simona Surdu, MD, PhD
Oral Health Workforce Research Center, Center for Health Workforce Studies, School of Public Health, University at Albany

ABSTRACT

Research Objectives: The objective of this study was to evaluate differences by gender of dental professionals in age, race/ethnicity, and practice characteristics including employment status, working hours, and practice location.

Study Design: The study used data drawn from the 2010, 2012, 2014 and 2016 Masterfile, a comprehensive database administered by the American Dental Association. The data analyses used descriptive and multivariable statistical methods to estimate differences in practice patterns between male and female dentists. Multilevel logistic regression models (odds ratios (OR) and 95% confidence intervals (CI)) were used to assess the association of dentists' employment status, working hours, and practice location with gender by age cohorts, adjusting for race/ethnicity, location of training, residency, specialty, rurality of state where practice was located, and year of data. All analyses were conducted in SAS v.9.4.

Population Studied: The study population consisted of all active dental professionals practicing in the 50 states and the District of Colombia during the years 2010-2016.

Principal Findings: Nationwide, from 2010-2016, there was an increase in the proportion of women (from 24.5% to 29.8%) and a decrease in the proportion of men (from 75.5% to 70.2%) working in dentistry. Over the study period, female dentists were more ethnically/racially diverse compared to male dentists. In 2016, a significantly (*P*<.0001) higher percentage of female dentists were Blacks or African Americans (6.0% vs. 2.9%), Hispanics (7.9% vs. 4.2%), Asians (23.4% vs. 12.1%), and other races/ethnicities (1.8% vs. 1.1%) compared to male dentists. In addition, proportionally more female dentists were educated outside the United States and Canada (8.3% vs. 4.4%, *P*<.0001), completed a residency (39.2% vs. 32.0%, *P*<.0001), and worked as pediatric dentists (6.1% vs. 2.8%, *P*<.0001) and public health dentists (0.5% vs. 0.3%, *P*<.0001) than male dentists. In all age cohorts, particularly in the 41-60 year-old cohort, female dentists were more likely to be employed (OR=2.96, 95% CI=2.82-3.11 in the 51-55 year cohort) and to work in practices in urban areas (OR=1.67, 95% CI=1.43-1.92 in the 56-60 year cohort) than their male counterparts. In all cohorts, but particularly among the cohorts ≤40 years of age, female dentists were more likely to work part-time (OR=4.25, 95% CI=3.74-4.82 in the 31-35 years cohort) compared to male dentists.

Conclusions: Gender shifts in dentistry may affect practice models and work hours. Understanding differences in practice characteristics by gender is important to anticipate changes in the professional workforce that might affect the availability of dental services, particularly in less populated areas.

CONTACT

Oral Health Workforce Research Center
Center for Health Workforce Studies
518-402-0250

info@oralhealthworkforce.org
www.oralhealthworkforce.org

INTRODUCTION

- Historically, females were not represented proportionally in dentistry but barriers to the profession have decreased over time due to societal and economic forces.
- Although the reasons for gender diversification in health professions, including dentistry can be attributed to a variety of endogenous and exogenous factors including delivery system remodeling, the long term impact of professional diversification is not yet understood.
- Concerns about changes in gender composition of the workforce often revolve around impacts on workforce capacity to meet the health care needs of a growing and aging population.
- The objective of this research was to describe practice preferences by gender that might:
  - Result in alterations in the delivery system
  - Effect the availability of dental services
  - Suggest changes in the distribution of dental professionals, especially in rural areas or underserved communities

METHODS

Secondary data analysis of the ADA Masterfile

This study used ADA Masterfile data from 2010, 2012, 2014, and 2016 to describe trends in the demographics and practice characteristics of the US dental workforce across years. The ADA Masterfile compiles dentist gender, race/ethnicity, age, dental specialty, year of graduation, dental school of graduation, practice type and location, among other variables.

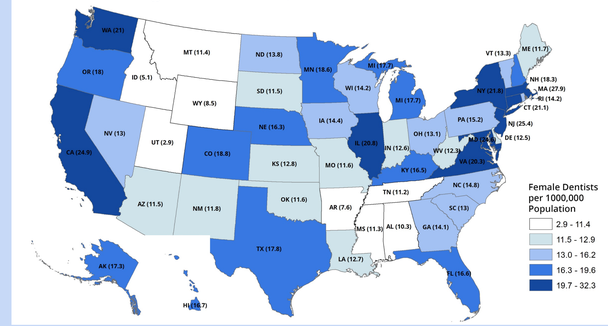
- Data analyses used descriptive and multivariable statistical methods to estimate differences in practice patterns between male and female dentists by age cohort.
- Gender differences in demographic characteristics and practice patterns in 2016 were described using frequencies and cross-tabulations and tested using the chi-square test for categorical variables and the t-test and Mann-Whitney U test for continuous variables.
- Multilevel logistic regression models (odds ratios (OR) and 95% confidence intervals (CI) were used to assess the association of dentists' employment status, working hours, and practice location with gender by age cohorts, adjusting for race/ethnicity, location of training, residency, specialty, rurality of state where practice was located, and year of data.
- Study findings were considered statistically significant if the *P* value was less than .05.
- All analyses were conducted in SAS v9.4

RESULTS

- Among the 192,260 professionally active dentists in 2016, 135,032 (70.2%) were male and 57,228 (29.8%) were female. The percentage of dentists who were female varied by state, from <20% in Utah, Idaho, Wyoming, Arkansas, and Montana to ≥35% in Maryland, Massachusetts, and DC.

RESULTS

Figure 1. Female Dentists Per 100,000 Population by Percent of Population Living in a Rural Area, 2016



- A significantly higher proportion of female than male dentists were Asian, Hispanic, black or African American, or of another race or ethnicity.

Table 1. Distribution of Dentists' Race/Ethnicity by Gender, 2016

Race/Ethnicity[a]	Female Dentists		Male Dentists	
	n	%	n	%
White	33,499	60.9%	105,395	79.8%
Asian	12,863	23.4%	16,012	12.1%
Hispanic	4,349	7.9%	5,499	4.2%
Black or African American	3,284	6.0%	3,826	2.9%
American Indian or Alaska Native, Native Hawaiian and/or other Pacific Islander	270	0.5%	465	0.4%
Other	706	1.3%	964	0.7%
Total	**54,971**	**100.0%**	**132,161**	**100.0%**

[a] Gender difference was statistically significant at *P*<.0001.

- Proportionally more female than male dentists were foreign-trained, and more females than males completed a dental residency. A significantly higher proportion of female than male dentists completed a dental residency in general practice dentistry, pediatric dentistry, and dental public health.

Table 2. Distribution of Dentists' Training Characteristics, 2016

Dental Education and Training[a]	Female Dentists		Male Dentists	
	n	%	n	%
Dental school				
Years since graduation				
Mean (range)	15.8 (0, 67)		25.0 (0, 73)	
Location of training				
US-trained	52,436	91.7%	128,730	95.6%
Foreign-trained	4,724	8.3%	5,943	4.4%
Total	**57,160**	**100.0%**	**134,673**	**100.0%**
Dental residency				
No	34,397	60.8%	91,029	68.0%
Yes	22,168	39.2%	42,912	32.0%
Total	**56,565**	**100.0%**	**133,941**	**100.0%**
Dental residency specialty				
General practice	11,957	54.1%	17,586	41.1%
Orthodontics and dentofacial orthopedics	2,605	11.8%	5,968	13.9%
Oral and maxillofacial surgery	653	3.0%	6,381	14.9%
Pediatric dentistry	3,456	15.6%	3,011	7.0%
Endodontics	1,224	5.5%	4,274	10.0%
Periodontics	1,213	5.5%	3,122	7.3%
Prosthodontics	710	3.2%	2,107	4.9%
Dental public health	140	0.6%	171	0.4%
Oral and maxillofacial pathology	104	0.5%	162	0.4%
Oral and maxillofacial radiology	37	0.2%	38	0.1%
Total	**22,099**	**100.0%**	**42,820**	**100.0%**

[a] Gender difference was statistically significant at *P*<.0001.

RESULTS (Cont.)

- In 2016, in all age cohorts, particularly in the 41-60 year-old cohort, female dentists were more likely to be employed and to work in practices in urban areas than their male counterparts.
- In 2016, in all age cohorts, but particularly among the cohorts <40 years of age, female dentists were more likely to work part-time compared to male dentists.

Table 3. Adjusted Odds Ratios for Dentists' Employment Status, Work Hours in Private Practice, and Practice Location In Association With Gender and Age, 2012-2016

Characteristics of Dentists	Employment Status: Employed Versus Practice Owner			Work Hours: Part-time Versus Full-time			Practice Location: Small Town/Rural Area Versus Suburban/Urban Area		
	OR	95% CI		OR	95% CI		OR	95% CI	
Female (reference: male)									
≤30 years of age	1.95	1.74	2.19	3.60	2.92	4.43	0.83	0.76	0.91
31–35 years of age	2.03	1.94	2.12	4.25	3.74	4.82	0.82	0.74	0.89
36–40 years of age	2.23	2.15	2.32	3.48	3.19	3.80	0.80	0.72	0.88
41–45 years of age	2.40	2.31	2.50	1.69	1.60	1.78	0.67	0.61	0.75
46–50 years of age	2.62	2.51	2.74	1.83	1.75	1.90	0.74	0.67	0.82
51–55 years of age	2.96	2.82	3.11	2.15	2.06	2.24	0.69	0.62	0.76
56–60 years of age	2.63	2.49	2.77	2.03	1.92	2.14	0.60	0.52	0.70
61–65 years of age	1.96	1.82	2.10	1.47	1.37	1.59	0.76	0.60	0.96
≥66 years of age	0.94	0.85	1.05	3.06	1.89	4.96	0.92	0.82	1.04
White (reference: other race/ethnicity)	0.78	0.77	0.79	1.22	1.20	1.25	3.54	3.35	3.74
US-trained (reference: foreign-trained)	1.33	1.16	1.52	2.28	2.04	2.55	6.22	4.80	8.06
No residency (reference: residency)	0.73	0.71	0.74	1.24	1.21	1.27	1.58	1.52	1.65
General practitioner (reference: specialist)	1.49	1.45	1.53	1.17	1.14	1.21	3.62	3.36	3.89

Note: Multilevel logistic regressions (odds ratios (OR) and 95% confidence intervals (CI)) were used to estimate the effect of gender by age, adjusting for dentists' race/ethnicity, location of training, residency, and specialty (Level 3), rurality of state where primary practice was located (Level 2), and year of data (Level 1). The interaction term (gender × age) and all variables were statistically significant at *P*<.0001.

CONCLUSIONS

- Geographic location of practices should be monitored over time to identify developing gaps by geography in access to dental services.
- Gender diversification is only one aspect of the changing oral health delivery system.
- The results of this study will be useful for policymakers considering strategies to enable access to oral healthcare services for underserved and vulnerable populations.
- It is important to continually examine the workforce to ensure the adequate supply and distribution of dental professionals to meet the needs of the growing, aging, and changing US population.

Funding for this study and for the OHWRC was provided by the Health Resources and Services Administration (HRSA) of the US Department of Health and Human Services (HHS) under a Cooperative Agreement for a Regional Center for Health Workforce Studies.

Data used in this study was supplied by the American Dental Association.