ORIGINAL ARTICLE

Slipping through the cracks: Just how underrepresented are minorities within the dental specialties?

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Abstract

Objective: There is a lack of diversity in the dental workforce. Efforts to enhance underrepresented minority (URM) recruitment and retention within dental school exist, but little effort has been made to track URM providers through education and practice. This study assesses the status of workforce diversity in the dental specialties and the predictors of URM dentist specialization.

Methods: The primary data used were a 2012 national sample survey of Hispanic/Latino (H/L), Black, or American Indian/Alaska Native (AI/AN) dentists in the US, supplemented by publicly available workforce data. Descriptive and multivariate statistical analyses were performed to describe the demographic composition of URM clinical general and specialist dentists and analyze changes in proportions of URMs specializing among age cohorts, differences in specific type of specialization, and racial concordance between specialists and their patients.

Results: The pathway continues to winnow with fewer URM dentists in specialty practice. Among all URM clinical dentists being first in his/her family to obtain a college degree, having a strong desire to work in his/her own cultural community or joining a loan repayment program due to debt load independently predicted lower odds of specialization. Alternatively, being initially foreign trained as a dentist and valuing professional training were independently predictive of higher odds of specialization.

Conclusion: The lack of diversity within the dental specialties is a critical flaw in our education and care delivery systems demanding clear actions toward improving the pathway into residency programs for URM students.

KEYWORDS
cultural diversity, graduate dental education, minority groups, specialties, dental, undergraduate dental education, under-represented minority students

INTRODUCTION

Underrepresentation of African Americans (AA), Hispanic/Latinos (H/L), and American Indian/Alaska Natives (AI/AN) in the United States (US) health professions has been a source of concern for decades. Among the various health professions, data from 1990–2000 shows dentistry is an outlier in lacking racial/ethnic diversity (hereafter, referred to as diversity) from other health professions such as nursing, medicine, veterinary, pharmacy and public health. While other professions increased diversity, dentistry decreased in the proportion of underrepresented minority (URM) matriculants over the entire decade [1].

In 2001, Robert Wood Johnson Foundation (RWJF) Pipeline to Professions program launched a decade long effort to increase the diversity of dental students, with a focus on enhancing matriculation of URMs and building cultural competence for all dental students [2,3]. A follow up study examining the impact of the Pipeline to Professions program showed that on average, the participating dental schools were successful in meeting program goals with enrollment of URM students increasing 54.4%

(excluding three of the schools, given they traditionally have high percentages of URM enrollment) versus 16% in non–dental Pipeline schools [4,5]. However, because the baseline numbers were so small, the overall impact on URM enrollment nationally was unremarkable. In 2004 at the time of their study, even though URMs comprised 32.9% of the US population, the American Dental Education Association (ADEA) found URMs still only comprised 12.4% of dental school applicants and 11.6% of first-year enrollees. In 2003–04, this was particularly pronounced for African American enrollment, which at all US dental schools was 5.4%, while 12.8% of the US population was Black [6]. Comparatively, Asian/Pacific Islanders and Whites comprised 69.7% of applicants and 71.1% of first-year enrollees [5]. By 2020, URMs comprised 18.1% of dental school applicants and 16.6% of first-year enrollees. Within this same year, Asian, Pacific Islanders and Whites comprised 70.1% of applicants and 72.9% of first-year enrollees [7].

The representative proportions of these URM groups within the US population has been growing, and according to the 2020 Census, the Black population (non-Hispanic, in combination or alone) was 16.4%, American Indian (non-Hispanic, in combination or alone) was 2.5%, and Hispanic, (any race) was 18.7% nationally, but ranges from 1.9 to 47.7 percent by state [8]. Given that URM population in 2020 consists of an estimated 37.6% of the US population, and only 16.6% of enrollees, there remains an extensive gap in parity between URM dentists and their representation of the general US population. Mertz et al., [9] found that to bring the proportion of URM dentists into parity with their proportion of the US population would require an additional 19,714 African American dentists, 31,214 Hispanic/Latino dentists, 2825 American Indian/Alaska Native dentists, and noted that to achieve this would entail all dental school graduates being only URM for a decade.

This lack of diversity in the dental workforce has been linked to disproportionately inadequate delivery of dental care to minority populations in the United States [10]. Per the Institute of Medicine, as early as 1899, scholars such as W.E.B. DuBois noted the lack of health professions diversity as being problematic to the health of the African American community [1]. Specifically, The Heckler Report published in 1980s was the first documented comprehensive study of the health status of minorities and became landmark in our understanding of the extent to which racial and ethnic minorities experience significant health disparities [11]. In 2006, Sinkford et al. [6,12] summarized the ADEA's stance on diversity in dentistry and its specialties which included: (1) support and enhance diversity of both faculty and students or practitioners in dental education, (2) use public needs as the benchmark for determining the types of diversity required in dental education, and (3) continually evaluate both the diversity needs of the public and the ability of dentists to meet those needs. Yet, despite implementing attempts to alleviate the shortages with such programs as the *Ventures Scholars Program, Summer Medical and Dental Education Program (SMDEP)*, efforts to improve racial/ethnic workforce diversity are falling short, and the gap in parity persists.

The diversity-focused efforts in place primarily focus on understanding and enhancing URM recruitment and retention within pre-doctoral dental training. While these programs are critical, little effort has been made to track URM providers through education and practice; leaving a major gap in our knowledge of the extent to which the documented disparities worsen beyond professional school and into residencies and specialization.

Studies published in 2004 and 2013 in medical education both stated that URMs faculty report barriers to communication and a lack of role models, in addition to feelings of discrimination, isolation, and racism. These studies concluded that the culmination of URM experiences combined to negatively affect recruitment, retention, and thereby diversity [13,14]. While similar studies lack in all of dentistry, these findings coincide with research from Criddle et al., [15] who evaluated factors affecting African Americans in Oral and Maxillofacial Surgery (OMFS) and found 25%–46% of participants experienced race-related harassment, and 48%–55% of participants believed there was a bias against African Americans in OMFS. Based on the American Dental Association (ADA) 2020–2021 Survey of Advanced Dental Education, among all the residents enrolled in advanced education programs 70.4% were in dental specialty programs and 29.6% were in advanced general education, while among URMs the proportions are 57.9% in specialties and 42.1% in advanced general education, and the non-URM are 72.5% and 27.5%, respectively [16]. Notably in 2020 only 12% of enrollment in the dental specialties were URM dentists, indicative of a narrowing pathway for already underrepresented groups which made up 15.4% of first year predoctoral students in 2017 [16,17]. We explored if data was collected by the ADA recognized dental specialties (as of 2012) through professional organization websites and via contacting representatives of the professional associations. However, either no, or minimal data on race or ethnicity are tracked by the specialty professional dental associations about their workforce, and hence unavailable for this study.

The purpose of this study is to assess the status of workforce diversity in the dental specialties and to understand the predictors of URM dentists going on to specialize. This understanding will inform pathway efforts and policies to address access to specialty care.

METHODS

Our study identifies and assess the status of workforce diversity in the dental specialties and to understand the pathway of underrepresented minority specialist dentists (URMs). The approach includes a literature review and quantitative analysis of practice patterns (Figure 1). The study was approved by University of California, San Francisco's Institutional Review Board as study #17-22552.
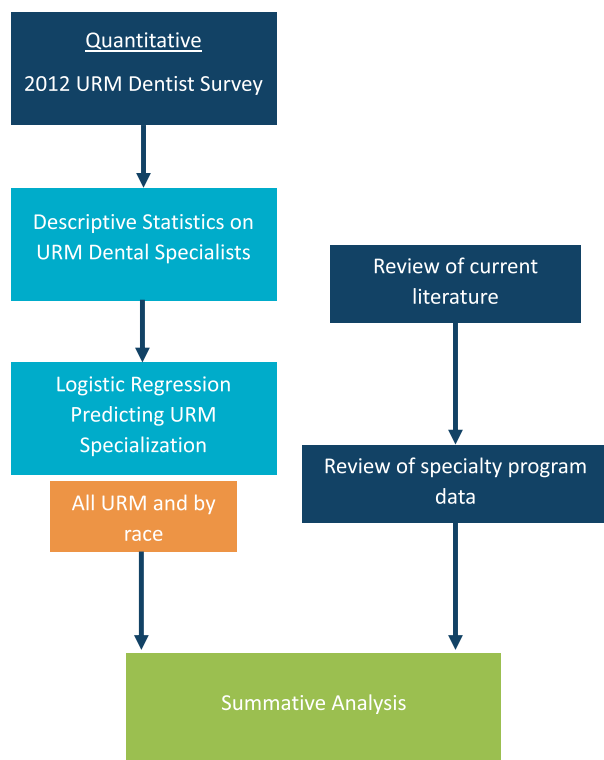
FIGURE 1 Study methodology [Color figure can be viewed at wileyonlinelibrary.com]

Data sources

There are two sources of data used in this study. First, we downloaded publicly available data from ADA, Health Policy Institute analysis of the ADA masterfile datasets from 2001 through 2018, which contain the most up-to-date information on dentists, at that time, in the United States [18]. These counts were used only as reference for the primary source of data, which is a 2012 national sample survey of Hispanic/Latino (H/L), Black, or American Indian/Alaska Native (AI/AN) dentists in the US [19]. The sample for the URM survey was selected from an earlier version of the ADA Masterfile (12,983 dentists) based on geographic location of the dentists and identification in the Masterfile as a member of an URM group. Removal of ineligible individuals yielded an adjusted universe of 11,382, an adjusted sample of 4389, and 1489 unique responses – 289 (19 percent) online and 1200 (81 percent) hard copy – for a final 34 percent response rate. The full survey methodology, including details on the response rate and evaluation of the response quality, has been previously published [19]. This analysis included only URM respondents who were practicing clinical dentistry and for whom we could determine specialty or general practice status (weighted $n = 11,137$). Statistical analysis was only conducted on the URM survey data.

Statistical analysis

The primary outcome variable of generalist versus specialist status within the URM survey data was created as dichotomous variable based on two questions (1) whether the dentist completed a dental specialty residency and (2) current type of practice (including all officially recognized specialties by the ADA). Respondents who did not complete a specialty residency, regardless of indication of main practice type, were coded as general practice. The goal of this study is to examine factors that specifically lead to advanced specialty training, so clear evidence of advanced training was a critical indicator. Individuals who indicated they completed specialty training but did not indicate current practice in a specialty field, were coded as specialists, and included in an "other/unknown" category (data not reported). Descriptive and multivariable statistical analyses were performed to describe the demographic composition of URM clinical general and specialist dentists and analyze changes in proportions of URMs specializing among age cohorts (proxy for trends over time), differences in specific type of specialization (e. g., pediatrics vs. orthodontics), and racial/ethnic concordance between specialists and their patients.

In order to determine what specific characteristics are predictive of URM specialization, we used an iterative process to reach a final set of models; one for all URM clinicians, and then one each for African-American and Hispanic dentists separately. We were unable to independently model factors for AI/AN dentists due to small sample size. The independent variables selected from data in the final models to predict specialization were restricted to factors that could theoretically influence specialization (see Table 1 for included variables). Personal characteristics included whether the dentist was the first in their family to graduate from college, whether they grew up in a rural community, as well as whether the dentist was US-born and/or US-trained (vs. foreign trained for initial dental degree) since there are differences in potential pathways to becoming a dental specialist in these instances. Standard control variables of age and sex were included. Personal values were measured by questions using a 5 item Likert scale that asked about the importance of *professional training and advancement* and *service to own cultural community* in their choice of initial practice location/type. Dental school factors included whether the dental school attended was a Historically Black College or University (HBCU), as well as a cumulative measure of personal experiences with racial/ethnic discrimination in different dental education settings (scale of 0 = never, 1 = 1 time, 2 = 2 times, 3 = 3 times, and 4 = 4 + times), and if they chose to pursue National Health Service Corps (NHSC) or Indian Health Service (IHS) loan repayment due to educational debt. To estimate the strength of these associations with presence or absence of specialization, we estimated ordinary logistic regression models. The regression coefficients were

T A B L E 1 Characteristics of URM survey respondents by general and specialty status, 2012

	URM practice type					
	Generalist		**Specialist**		**Overall**	
	Mean	**N**	**Mean**	**N**	**Mean**	**N**
Mean age	49.3		48.8		49.2	
N (weighted)=		9095		2042		11,137
Gender	%	N	%	N	%	N
Male	59.8		60.3		59.9	
Female	40.2		39.7		40.1	
N (weighted)=		9095		2042		11,137
Race/ethnicity	%	N	%	N	%	N
American Indian/Alaskan Native	3.2		2.3		3.1	
African American	51.1		46.4		50.3	
Hispanic/Latino	45.6		51.3		46.7	
N (weighted)=		9095		2042		11,137
Community raised	%	N	%	N	%	N
Urban	71.5		77.5		72.6	
Rural	28.5		22.5		27.4	
N (weighted)=		8968		2020		10,988
First person in immediate family to graduate college	%	N	%	N	%	N
No	60.8		76.1		63.6	
Yes	39.2		23.9		36.4	
N (weighted)=		9064		2038		11,102
Primary practice area	%	N	%	N	%	N
General practice	100.0	9095			81.7	9095.1
Pediatric dentistry			23.9	488.7	4.4	488.7
Oral and maxillofacial surgery			14.0	286.4	2.6	286.4
Orthodontics and dentofacial orthopedics			11.8	240.8	2.2	240.8
Periodontics			11.3	231.3	2.1	231.3
Endodontics			9.3	189.0	1.7	189.0
Prosthodontics			8.1	164.7	1.5	164.7
Oral and maxillofacial pathology			0.6	11.3	0.1	11.3
Dental public health			0.5	10.6	0.1	10.6
Oral and maxillofacial radiology			0.1	2.1	0.0	2.1
Not working in specialist area			20.4	417.1	3.7	417.1
N (weighted)=		9095		2042		11,137
Ever foreign trained	%		%		%	
No	89.6		75.8		87.0	
Yes	10.4		24.2		13.0	
N (weighted)=		9033		2037		11,070
Initial practice considerations	%		%		%	
Income potential	73.6		70.9		73.1	
Family considerations	70.2		74.1		70.9	
Geographic location	70.6		72.6		71	
Professional training or advancement in my practice	53.7		62.0		55.2	
Educational debt	57.1		43.6		54.6	
Working with underserved populations	36.8		34.6		36.4	
Desire to work in my own cultural community	36.8		25.7		36.4	
N (weighted)=		8746		1932		10,678

(Continues)

T A B L E 1 (Continued)

| | URM practice type | | | | | |
| | Generalist | | Specialist | | Overall | |
	Mean	N	Mean	N	Mean	N
What impact did educational debt have on your practice choices?	%		%		%	
Did not impact my practice options	45.8		57.1		47.9	
I could not afford to start my own practice	22.3		19.6		21.8	
I could not afford to purchase a practice	17.1		17.8		17.2	
I joined the Federal Dental Services or Armed Forces	7.5		7.9		7.5	
I could not practice in the location I wanted to	7.3		7.4		7.3	
I joined the National Health Service Corps or Indian Health Service	6.0		0.6		5.0	
Other reasons	5.5		5.3		5.5	
N (weighted)=		8964		2032		10,997
Dental school type	%		%		%	
All public	52.9		48.8		52.2	
All private (HBCU + non HBCU)	22.4		18.6		21.8	
HBCU only	24.7		32.6		26.0	
N (weighted)=		8091		1544		9635
Frequency of discrimination (range 0–4, means)	Mean		Mean		Mean	
In dental school	1.5		1.3		1.4	
In dental employment	0.8		0.9		0.8	
In the patient-provider relationship	1.7		1.7		1.7	
In interactions with medical/dental colleagues	1.2		1.2		1.2	

Source: Authors' analysis of 2012 URM Sample Survey.
Abbreviation: HBCU, Historically Black College or University; URM, underrepresented minority (American Indian/Alaska Native, Black, Hispanic).

exponentiated to obtain Odds Ratios (OR). Values of OR greater than one indicates higher odds to observe the outcome (being a specialist) when the explanatory variable increases by one unit, when all other variables are held constant. Alternatively, values below one indicates lower odds of association of the explanatory variable with specialization. p-values of 0.05 or lower were deemed as statistically significant. All analyses were weighted to adjust for survey design using a commercially available software package—STATA 14™ with "svy" extension. The models were tested for goodness of fit using two separate tests, and in both of them a null hypothesis of fit was retained when $p > 0.05$ [20,21].

RESULTS

Characteristics of the URM dentist workforce

Descriptive statistics on URM specialist and generalist were generated from the 2012 URM survey (Table 1). Among URM specialists, the most represented field was pediatric dentistry with almost a fourth of URM specialists being pediatric dentists. While other specialties such as public health and prosthodontics represented a significantly smaller percentage, specifically only a tenth of the URM specialist subgroup combined. Among factors reported as important in determining the initial practice plans for specialists, family considerations were listed as the top reason, however the biggest difference between generalist and specialists is in the impact of educational debt. URM generalists were more likely than URM specialists to be the first to graduate college, to grow up in a rural community, and to attend a public dental school. Lastly, individuals that were initially foreign trained (primarily Hispanic dentists), or those US trained dentists who attended a private dental school, are more represented within the specialty subset.

Specialization over age cohorts

As a proxy for longitudinal trends in specialization, we examined the rate of specialization by age cohort (Figure 2). While the raw number of URM dentists has increased (represented by the lines) both in general and specialist categories, the overall rate of specialization of URMs varies by cohort surveyed, and is proportionately less in the <44 cohorts than in the 65+ cohort. Data on race/ethnicity of the workforce published by ADA and
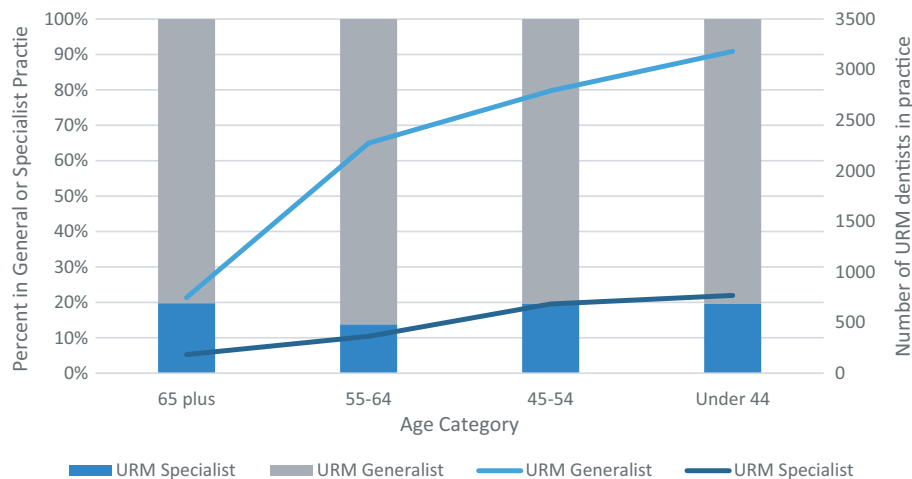
FIGURE 2 URM specialization by age cohort (in practice as of 2012). URM, underrepresented minority. Weighted $N = 10,995$ [Color figure can be viewed at wileyonlinelibrary.com]

ADEA only go back 20 years so cannot be used reliably to corroborate our 2012 practice data.

Factors associated with URM dentists' specialization

Among URM dentists a number of factors were statistically significant in predicting dental specialization in a logistic regression (Table 2). Among all URM clinical dentists being first in his/her family to obtain a college degree (OR = 0.50), having a strong desire to work in his/her own cultural community (OR = 0.49) or joining the NHSC/IHS due to debt load (OR = 0.11) were all significantly associated with lower odds of specialization. Alternatively, being initially foreign trained as a dentist (OR = 3.21) or valuing professional training and advancement (OR = 1.11) were significantly associated with higher odds of specialization, although the latter was not statistically significant at the 5% significance threshold (it was 6%). Other factors that were tested but were not significantly associated with the odds of specialization (data not shown) were race, income, level of debt, and interest in self-employment.

Being that URM racial/ethnic subgroups are quite different, we modeled African American and Hispanic/Latino dentists separately, and found that some predictors differed between groups and from the overall model. The small sample size did not permit modeling American Indian/Native American dentists separately, although they are included in the all URM model.

Among African American clinical dentists, being female (OR = 0.75), growing up in a rural community (OR = 0.39), being first in his/her family to obtain a college degree (OR = 0.43), having a strong desire to work in his/her own cultural community (OR = 0.49), joining the NHSC/IHS due to debt load (OR = 0.11) or having

more discriminatory experiences in dental school (OR = 0.80) were associated with lower odds of specialization. Attending an HBCU exerted a positive yet insignificant effect on specialization, but improved model fit (R^2). Among the African American dentists, very few were foreign trained therefore that variable was not included in this model.

Among H/L clinical dentists, approximately 25% are foreign trained for their initial dental degree. This factor is the strongest positive predictor of specialization for this group (OR = 3.64) along with valuing professional advancement and training (OR = 1.22) controlling for other factors in the model. In contrast to African American dentists, the number of discriminatory events in dental school is significantly associated with greater odds of specialization within H/L (OR = 1.22). Similar to African-Americans, within in the H/L group, being first in his/her family to obtain a college degree (OR = 0.52) having a strong desire to work in his/her own cultural community (OR = 0.40) or joining the NHSC/IHS due to educational debt (OR = 0.11) was significantly associated with lower odds of specialization.

Practice characteristics of URM specialists

Finally, we examined current practice patterns of URM specialists. The geographic distribution of specialist dentists by race mirrors trends seen on previously published race/ethnicity dentist population maps, with African American specialist more densely populated in the South Central and Southern Atlantic regions (53.9%) and H/L specialists more populated in the Mountain, Pacific and some of the Southern Atlantic regions (58.9%) [22–24].

Racial/ethnic concordance between URM providers and URM patients has been previously demonstrated and this concordance pattern is maintained with the

TABLE 2 Logistic regressions predicting specialization among URM dentists

	All URM clinical dentists			Black/African-American clinical dentists			Hispanic/Latinx clinical dentists		
	Odds ratios	95% CI	p	Odds ratios	95% CI	p	Odds ratios	95% CI	p
Intercept	0.31	0.23–0.41	**<0.001**	0.74	0.50–1.09	0.13	0.32	0.20–0.5	**<0.001**
Age	1.00	0.99–1.00	0.59	1.00	0.99–1.00	0.18	0.99	0.98–1.00	**0.05**
Sex	0.92	0.82–1.04	0.17	0.75	0.62–0.90	**0.002**	0.93	0.78–1.09	0.36
Grew up in rural community (1 = Yes, 0 = No)				0.39	0.31–0.49	**<0.001**			
Ever foreign trained (1 = Yes, 0 = No)	3.21	2.79–3.69	**<0.001**				3.64	3.04–4.43	**<0.001**
Were you the first person in your immediate family to graduate college? (1 = Yes, 0 = No)	0.50	0.45–0.57	**<0.001**	0.43	0.35–0.53	**<0.001**	0.52	0.44–0.62	**<0.001**
Factors important in choice of initial practice									
Professional training or advancement in my practice (binary, 1 = important or very important, 0 = not important)	1.11	0.99–1.24	0.06				1.22	1.04–1.44	**0.0017**
Desire to work in my own cultural community (binary, 1 = important or very important, 0 = not important)	0.49	0.43–0.55	**<0.001**	0.49	0.41–0.60	**<0.001**	0.40	0.33–0.48	**<0.001**
Effect of educational debt on practice choices									
I joined the National Health Service Corps or Indian Health Services (binary, 1 = selected, 0 = not selected)	0.11	0.05–0.19	**<0.001**	0.11	0.04–0.29	**<0.001**	0.11	0.03–0.46	**0.002**
Dental school factors									
Discrimination experiences in dental school (Count 0–4)	0.98	0.95–1.02	0.35	0.80	0.75–0.84	**<0.001**	1.22	1.16–1.28	**<0.001**
HBCU (1 = Attended, 0 = Did not attend)				1.12	0.91–1.36	0.28			
Observations	1167			479			556		
Cax and Snell's R^2/Nagelkerke's R^2	0.429/0.430			0.530/0.530			0.556/0.556		

Abbreviations: CI, 95% confidence interval; HBCU, Historically Black College or University; p, p-value; URM, underrepresented minority.
Note: Bold values denote statistical significance at the $p < 0.05$ level.

TABLE 3 Racial concordance between URM dental specialists and their patients

	Dental specialist race/ethnicity			
Patient race/ethnicity (mean %)	African American/Black	American Indian/Native American	Hispanic/Latino	URM total (%)
African-American/Black	**44.7**	12.6	13.6	29.4
American Indian/Native American	4.2	**19.7**	3.9	4.7
Hispanic/Latino	20.2	15.0	**41.2**	30.2
Caucasian/White	30.9	55.3	39.2	35.6
Asian/Pacific Islander	5.8	6.6	6.6	6.2

Note: Patient racial distribution is self-reported by dentists.
Source: Author's analysis of the 2012 URM Dentist survey.
Abbreviation: URM, underrepresented minority.
Note: Bold values denote statistical significance at the $p < 0.05$ level.

specialties [9]. H/L specialists report a greater share of H/L patients (41.2%), African American specialists report a greater share of AA patients (44.7%) and AI/AN specialists report the greatest share of AI/AN patients (19.7) compared to their URM counterparts (Table 3).

LIMTATIONS

This study has a number of limitations. The data are from 2012/2013 however the experiences of minority dentists in the country has likely not shifted radically since then, and the reported lived experiences of these providers is just as valid today as when reported a decade ago. In addition, the 34% response rate may mean some bias was present in our weighting, but again, the strength of the associations led us to believe that the factors reported as instrumental in this paper reflect reality. Finally, the data are cross sectional, and therefore cannot track trends over time, and as with all survey data, this is self-reported and may be subject to recall bias.

DISCUSSION

To our knowledge, this study is the first to analyze national data about possible variables that influence whether or not URM dentists decide to specialize. This study elucidates the factors that URM dentists' consider in their pursuit of specialization within the dental profession. Previous studies have examined these challenges at the stage of initial entry to dental schools, at single institutions, and have evaluated specific pathway programs. This study extends that work to include the barriers for URM dentists entering specialty programs, adding to the evidence of a need to enhance strategies to decrease the number of URMs slipping through the cracks in the already small pathway.

Among URMs in our quantitative analysis, being the first to go to college was a significant deterrent of specialization. A study done by McCarron in 2012 showed that first generation college students have paths to higher education much different than their non-first generation peers [25]. McCarron's results discover that high pre-college aspirations and family support are vital in the persistence of educational attainment and prevention of burnout for first generation students. Based on this research, it could be possible that high pre-college aspirations and family support continue to be necessary during the undergraduate years and are key in shaping first generation students' aspirations to pursue advanced degrees [26]. Clearly in the face of public referenda, judicial decisions, and lawsuits challenging affirmative action policies, many higher education institutions have had to abandon the use of race and ethnicity as factors in admissions decisions. The introduction of holistic review in admissions was expected to somewhat mitigated the

drastic reduction in affirmative action [27–29], The finding that African American women in particular are less likely to specialize is concerning, but consistent with recent research examining gender differences in dentists' practice patterns and speaks to the particular intersectional challenges of URM women [30].

Diversity in health care profession is an important factor for not just recruitment but also for reducing discrimination and aiding in retention. Information on the dentist workforce is available from a number of sources, although complete demographic information is still lacking [19]. In particular, the lack of being able to obtain the basic diversity demographic information of specialty subgroups from the respective specialty organizations shows not only how little information is known by the organizations that represent dental specialists, but also how diversity and inclusion continues to be devalued by professional leadership. Without specialty organizations taking the initiative to track this information, the ability to build strategies for improvement will remain a moot point. Therefore, a critical first step is to bring visibility to the issue by prioritizing data collection among all dental specialty organizations, and then follow-up work to enhance diversity, with a focus on creating associations that are not just mentoring URM dental students but also creating thoughtful and intentional pathways into their specialties.

This study showed that URM dentists who chose primary care for loan repayment /debt relief are less likely to specialize. There have been many workforce focused policy attempts to improve access to care, such as the NHSC/IHS, which have benefited minority dentists. However, in that these programs do not pertain to specialists, these programs which are critical for enhancing community access, are also pulling from the already small pool of URMs who could potentially go on to specialize, by capturing them at the general level. To enhance the pathway end to end, policy objectives such as NHSC/IHS for specialists or other loan repayment programs for URMs who go into specialties can not only increase recruitment and retention by lessening the burden of debt but also, assist with public health efforts of increasing URM specialists in underserved areas. As well, this study shows that URMs who are initially foreign trained are more likely to achieve specialty status, which makes sense when the policy factors of US licensure requiring graduation from a commission on dental accreditation program, are taken into account [31]. This is highly skewed to Hispanic/Latinx dentists but none the less points to the need for more planned and rational workforce policymaking to address the health care needs of the US population.

CONCLUSION

The pathway that prepares diverse students for careers in health professions continues to leak, and despite individual program successes, cumulative impacts are not

enough to improve the disparity that exists. This study shows despite efforts aimed to improve the pathway of URM students into dental school, there is still a significant disparity that exists as URM dentists continue on to specialize. Further, this disparity has not changed much over time and our quantitative results show continued exacerbation of this gap. This information coupled with the general lack of information available surrounding this topic shows that the lack of diversity within the dental specialties continues to be a critical detriment to our educational system, and unless clear actions centered around this topic are initiated improving the pathway into residency programs for URM students from beginning to end, we will continue to be unsuccessful in efforts to remedy the social injustice within the profession, and ultimately to improve health equity.

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