

Orthodontic care for underserved patients

Professional attitudes and behavior of orthodontic residents and orthodontists

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ABSTRACT

Objectives: To explore whether orthodontic residents and orthodontists differ in their attitudes and behavior concerning the treatment of underserved patients and to investigate how background factors such as the providers' gender, ethnicity/race, and age affect these attitudes and behavior.

Materials and Methods: Survey data were collected from 135 residents in US and Canadian graduate orthodontic programs and from 568 active members of the American Association of Orthodontists. Attitudes toward various aspects of treating underserved patients were rated on a five-point scale, with 1 indicating the most negative attitude and 5 indicating the most positive.

Results: Orthodontic residents had more positive attitudes about treating poor patients (3.02 vs 1.99; $P < .001$), pro bono cases (3.87 vs. 3.45; $P < .001$), and patients with craniofacial anomalies (3.64 vs 3.01; $P < .001$) or mental retardation (3.13 vs 2.72; $P < .001$) than orthodontists. However, compared to orthodontists, lower percentages of residents intended to treat pro bono cases (73.5% vs 83%; $P = .009$) and patients with craniofacial anomalies (63.6% vs 82.9%; $P < .001$) or mental retardation (55% vs 81.5%; $P < .001$). The providers' gender did not have an effect on these attitudes and related behavior, while ethnicity/race and age of the providers were relevant.

Conclusions: Residents had more positive attitudes concerning the treatment of underserved patients than orthodontists. However, their behavioral intentions did not indicate an increased willingness to provide care for these patients. (*Angle Orthod.* 2011;81:1090–1096.)

KEY WORDS: Access to care; Minority; Medicaid; Craniofacial anomalies; Special needs; Orthodontic care

INTRODUCTION

In 2000, the first ever US Surgeon General's Report on oral health drew attention to the fact that patients from underrepresented minority and/or socioeconomically disadvantaged backgrounds and patients with special needs have poorer oral health and more difficulties with access to care than the rest of the US population.¹ Exacerbating these oral health problems is the finding that these patients might encounter additional difficulties when trying to access specialty

care.² Given that 70% of patients seeking orthodontic care were referred by general dentists,³ a lack of general dental care is likely to contribute to this situation. In addition, the fact that orthodontic treatment is even less likely to be covered by dental plans than other procedures¹ and is often considered elective can make access to orthodontic care a major problem for underserved patients.

The lack of orthodontic care is likely to affect a substantial percentage of US citizens. Based on the Third National Health and Nutrition Examination Survey (NHANES-III),⁴ irregularity of occlusion would be severe enough in 15% of the US population to affect social acceptability and function. Research has also shown that 57%–59% of the US population has some degree of orthodontic treatment need.⁵ Given that severe malocclusion can be the cause of social discrimination and problems with oral function and hygiene,⁵ a lack of orthodontic care can impact an individual's entire life. Therefore, it seems important to find ways to increase access to orthodontic care for all patients in need of this care. Gaining a better understanding of orthodontists' attitudes and behavior

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concerning underserved patients might be a first step in this direction.

Attitudes concerning the provision of care to ethnic/racial minority patients seem to differ among providers from different ethnic/racial backgrounds. Overall, black dental students were more optimistic about serving vulnerable and low-income populations and viewed low-income patients less negatively than white dental students.^{6,7} When providers treat patients from different ethnic/racial backgrounds, they might encounter language and cultural issues, which might lead to less favorable attitudes toward these patients and to more clinical uncertainty within the patient-provider relationship.^{6,8} Compounding this problem is the fact that larger percentages of minorities have a lower socioeconomic background,⁶ thus connecting the attitudes toward these minorities with attitudes toward socioeconomically disadvantaged patients and patients on Medicaid.⁹

Concerning attitudes toward patients on Medicaid, the research has shown that many orthodontists,⁹ general dentists, and other specialists reported that many factors discouraged them from participation in the Medicaid program: low reimbursement rates, excessive paperwork, the need for prior authorization of treatment plans, denial of payment, restrictions in reimbursable services, payment delays, linkage with fraud, and patient behavior such as broken appointments and poor cooperation.⁹⁻¹²

On the other hand, orthodontists have, on average, more positive attitudes toward treating patients with special health care needs, such as those with craniofacial anomalies.¹³ One reason that clinicians might provide only limited care for patients with craniofacial anomalies might be linked to the fact that a high percentage of patients with craniofacial anomalies are on Medicaid, and this might not be related to potential difficulties inherent in treating patients with craniofacial anomalies.¹³

In general, research has shown that attitudes concerning underserved patients are related to providers' professional behavior.¹⁴⁻¹⁶ Gaining a better understanding of orthodontists' attitudes and how they can be improved might therefore contribute to increasing the number of orthodontists who are willing to provide care for underserved patients. For example, research in 2003-2004 in North Carolina showed that there were 480,000 Medicaid-eligible children, and only 0.5% of these children had received orthodontic care.⁹ Research also showed that, in North Carolina and Washington, only 10 orthodontists accounted for 80% of the orthodontic treatment provided under the Medicaid program.^{9,17}

In addition to studying the way attitudes might affect behavior, this study also proposes to analyze whether

certain demographic factors, such as the orthodontists' gender, ethnic/racial background, and age, as well as educational factors affect professional attitudes and behavior in this context. Therefore, this study explored orthodontists' and orthodontic residents' attitudes and behavior regarding the provision of care for underserved patients and sought to determine how the providers' characteristics affected these attitudes and behaviors.

MATERIALS AND METHODS

This research was approved by the Institutional Review Board for the Health Sciences at the University of Michigan at Ann Arbor. Data were collected from 135 orthodontic residents and 568 active members of the American Association of Orthodontists (AAO). The first group consisted of 135 of the approximately 325 orthodontic residents from US and Canadian graduate orthodontic programs who attended the 2007 Graduate Orthodontic Residents Program (GORP) in St Louis, Missouri (response rate: 42%). The 568 practicing orthodontists responded to an anonymous survey that had been mailed to 1,500 randomly selected AAO members (response rate: 38%). The majority of respondents were male (62% of residents, 79% of orthodontists) and white (64% of residents, 88% of orthodontists).

Data from graduate students were collected at the GORP meeting in August 2007. The graduate students were informed about the study when they registered at the conference and asked to respond to an anonymous survey. Respondents participated in a drawing for an iPod Shuffle after they returned the survey.

Data from orthodontists were collected with a mailed survey. Address labels were purchased from the AAO. The mailing comprised a cover letter written by the dean of the dental school informing the recipients about the study, a form to indicate consent to participate, a survey, and a self-addressed stamped envelope in which they could return the survey.

Both surveys assessed the respondents' demographic backgrounds and practice characteristics. Eighteen items assessed educational experiences, and eight items measured attitudes concerning the treatment of these patients. To assess the respondents' professional behavior, the residents reported their behavioral intentions in the future. If the numbers of currently treated patients from these groups would have been included as the indicator of the residents' professional behavior, this variable might not have reflected the residents' own motivation for treating these patients, because during their residency programs they were likely to have been assigned patients. The residents' behavioral intentions were therefore

considered more appropriate indicators of their own actions concerning the treatment of patients from these groups. Given that the orthodontists reported their actual professional behaviors, while the residents indicated behavioral intentions, a comparative indicator had to be constructed. The numerical responses of the orthodontists concerning how many patients from a certain group they treated were therefore dichotomized into the categories "I do not treat these patients" vs "I do treat these patients." The residents' responses concerning the statements that they would treat patients from these different groups were given on five-point answer scales ranging from 1 = "disagree strongly" to 5 = "agree strongly." The responses 1 to 3 were categorized as an indication of treatment being unlikely and the responses 4 and 5 as an intention to treat patients from these backgrounds. A dependent variable, "professional behavior," was therefore created by categorizing the orthodontists' actual behavior and the residents' behavioral intentions.

Statistical Analyses

The data were analyzed with SPSS software (version 17.0).¹⁸ Descriptive statistics were used to provide an overview of the distribution of the respondents' answers. Pearson correlation coefficients were computed to determine relationships between the variables. Analyses of variance were used to compare the average responses of orthodontists and residents. A P value $< .05$ was considered statistically significant.

RESULTS

Of the 135 residents, 62% were male and 39% were female, whereas only 21% of orthodontists were women ($P < .001$). As expected, the residents' average age was lower than the orthodontists' average age (29 vs 48 years; $P < .001$; ranges, 23–43 and 28–75 years, respectively). While 88% of the orthodontists were of a European background, only 64% of the orthodontic residents were white, with the second largest ethnic/racial group being Asian residents (17%) and orthodontists (5%). The orthodontists had practiced, on average, for about 18 years (range, 0–44 years), with 73% working in solo practices and 19% in partnerships.

The first objective was to compare residents' and orthodontists' professional attitudes and behavior concerning underserved patients. Although patients from these groups might be currently underserved, this situation might change in the future, when younger cohorts of orthodontists will replace older cohorts. The residents' responses were therefore compared with the responses of younger orthodontists (<50 years of

age) and older orthodontists (50 years and older). The results showed that both residents and orthodontists had rather positive attitudes concerning the treatment of patients of different ethnic backgrounds (see Table 1). The groups differed in their attitudes concerning patients from lower socioeconomic backgrounds, with residents expressing a neutral attitude while younger and older orthodontists responded more negatively to the statement "I like to treat patients on Medicaid" (3.02 vs 2.00/1.96, respectively; $P < .001$). However, the average agreement with the statement "I like to treat patients as pro bono cases" supported the original hypothesis that younger cohorts might have more positive attitudes toward underserved patients than older cohorts. Residents responded most positively, and younger orthodontists had more positive attitudes than older orthodontists (3.87 vs 3.60/3.31, respectively; $P < .001$).

The comparisons of the attitudes toward underserved patients with special needs also showed that residents had more positive attitudes, while younger and older orthodontists were more neutral (craniofacial anomalies: 3.64 vs 3.02/3.01, respectively; $P < .001$; mental retardation: 3.13 vs 2.70/2.74, respectively; $P < .001$). However, both younger and older orthodontists felt more confident than residents in providing care for these patients (craniofacial anomalies: 2.86 vs 3.33/3.42, respectively; $P < .001$; mental retardation: 2.97 vs 3.26/3.37, respectively; $P = .005$).

While residents did indeed have more positive attitudes toward several of these underserved patient groups compared to orthodontists, the predicted behavioral differences were contradicted by the findings. The percentages of providers in the three groups did not differ in providing care for patients from different ethnic backgrounds (92% vs 90%/92%, respectively; $P = .789$) or for patients on Medicaid (38% vs 33%/38%, respectively; $P = .444$) (see Table 1). However, lower percentages of residents indicated that they would provide care for pro bono cases (74% vs 79%/87%, respectively; $P = .003$), patients with craniofacial anomalies (64% vs 83%/83%, respectively; $P < .001$), and patients with mental retardation (55% vs 79%/83%, respectively; $P < .001$) compared to younger and older orthodontists.

Concerning the question of whether female respondents would have more positive attitudes and behaviors than male respondents, the data showed that female respondents disagreed less strongly with the statement "I like to treat patients on Medicaid," compared to male respondents (2.39 vs 2.12; $P = .017$) and were less confident in providing care for patients with craniofacial anomalies than male respondents (3.02 vs 3.35; $P = .002$) (Table 2). A higher percentage of male respondents indicated that they

Table 1. Professional Attitudes and Behaviors of Residents and Orthodontists Younger Than 50 Years and Older Than 50 Years

	Residents	Orthodontists <50 y	Orthodontists ≥50 y	P
<i>Attitudes^a</i>				
<i>Different ethnic backgrounds</i>				
I like to treat patients from different ethnic backgrounds. ^a	4.50	4.61	4.50	.176
My practice (will) include(s) patients from ethnic backgrounds that are different from my own background.	4.62	4.66	4.75	.157
<i>Medicaid and pro bono cases</i>				
I like to treat patients on Medicaid.	3.02	2.00	1.96	< .001
I like to treat patients as pro bono cases.	3.87	3.60	3.31	< .001
<i>Craniofacial anomalies and mental retardation</i>				
I like to treat patients with craniofacial anomalies.	3.64	3.02	3.01	< .001
I like to treat patients with mental retardation.	3.13	2.70	2.74	< .001
I am confident treating patients with craniofacial anomalies.	2.86	3.33	3.42	< .001
I am confident treating patients with mental retardation.	2.97	3.26	3.37	.005
<i>Behavior^b ("I will treat"/"I provide care for")</i>				
Patients from different ethnic backgrounds ^c	92%	90%	92%	.789
Patients on Medicaid	38%	33%	38%	.444
Pro bono cases	74%	79%	87%	.003
Patients with craniofacial anomaly	64%	83%	83%	< .001
Patients with mental retardation	55%	79%	83%	< .001

^a The answers to the attitudinal items were given on five-point answer scales from 1 = "disagree strongly" to 5 = "agree strongly."

^b Residents responded to the questions concerning their behavioral intentions about treating patients with these characteristics on a scale from 1 = "disagree strongly" to 5 = "agree strongly." Answers "1" to "3" were coded as "No" (= "I will not treat in the future") and answers "4" and "5" were coded as "Yes" (= "I will treat these patients in the future"). Orthodontists reported the number of patients treated with each characteristic. These numbers were categorized into "0 patients treated" = "No patients treated" vs "more than 0 patients treated" = "Yes, patients with this characteristic treated."

^c The orthodontists responded to the statement "My practice includes patients from all ethnic backgrounds" on a five-point scale. Responses "1" (= disagree strongly), "2" (= disagree) and "3" (= neutral) were coded as "No" (= "I will not treat in the future"). Responses "4" (agree) and "5" ("agree strongly") were coded as "Yes" (= "I will treat these patients in the future").

treated pro bono cases (84% vs 72%; $P < .001$) (Table 2).

Concerning the effects of the respondents' ethnic/racial background, the data showed that non-European respondents agreed more strongly with the statement "I like to treat patients from different ethnic backgrounds" (4.79 vs 4.49; $P < .001$) and disagreed less strongly with the statement "I like to treat Medicaid patients" (2.72 vs 2.08; $P < .001$) than white respondents (Table 3). While non-European respondents were more likely to treat patients from different ethnic backgrounds (97% vs 90%; $P = .004$), they were less likely to provide care for pro bono cases (67% vs 84%; $P < .001$), for patients with craniofacial anomalies (69% vs 82%; $P = .002$) and for patients with mental retardation (53% vs 81%; $P < .001$) than white respondents (Table 3).

Concerning relationships between attitudes and behaviors, Table 4 shows that the more positive the respondents' attitudes were toward a particular group of patients, the more likely they were to treat these patients. For example, the more positive the respondents' attitudes were toward patients from different ethnic/racial groups, the more likely they were to treat these patients ($r = .28$; $P < .001$). The more positive their attitudes were toward patients on Medicaid, the

more likely they were to treat these patients ($r = .49$; $P < .001$). This relationship was also apparent for pro bono cases ($r = .42$; $P < .001$), patients with craniofacial anomalies ($r = .27$; $P < .001$), and patients with mental retardation ($r = .19$; $P < .001$). Table 4 also shows that respondents' confidence and behavior in respect to treating both patients with craniofacial anomalies and mental retardation are correlated ($r = .36$, $P < .001$; $r = .27$, $P < .001$).

DISCUSSION

The objectives of the present study were to assess the professional attitudes and behaviors of residents and practicing orthodontists concerning the treatment of underserved patients, such as those from different ethnic/racial backgrounds, those who are socioeconomically disadvantaged, and those with special needs. Given the overwhelming evidence provided by the US Surgeon General's Report¹ that members of these groups have a disproportionate amount of dental care needs but also a disproportionate degree of problems in accessing dental care, it is interesting to explore how orthodontists respond to this situation.

Overall, orthodontists and residents held rather positive attitudes toward treating patients from different ethnic/

Table 2. Professional Attitudes and Behaviors of Male vs Female Respondents Concerning Treating Underserved Patients

	Male	Female	P
<i>Attitudes^a</i>			
<i>Different ethnic backgrounds</i>			
I like to treat patients from different ethnic backgrounds.	4.53	4.59	.342
My practice (will) include(s) patients from ethnic backgrounds that are different from my own background.	4.60	4.48	.352
<i>Medicaid and pro bono cases</i>			
I like to treat patients on Medicaid.	2.12	2.39	.017
I like to treat patients as pro bono cases.	3.48	3.67	.091
<i>Craniofacial anomalies and mental retardation</i>			
I like to treat patients with craniofacial anomalies.	3.12	3.18	.523
I like to treat patients with mental retardation.	2.76	2.91	.115
I am confident treating patients with craniofacial anomalies.	3.35	3.02	.002
I am confident treating patients with mental retardation.	3.25	3.23	.814
<i>Behavior^b (type of patients)</i>			
Patients from different ethnic backgrounds ^c	92%	88%	.091
Patients on Medicaid	37%	33%	.169
Pro bono cases	84%	72%	.001
Patients with craniofacial anomaly	80%	77%	.236
Patients with mental retardation	78%	72%	.086

^a The answers to the attitudinal items were given on five-point answer scales from 1 = "disagree strongly" to 5 = "agree strongly."

^b Residents responded to the questions concerning their behavioral intentions about treating patients with these characteristics on a scale from 1 = "disagree strongly" to 5 = "agree strongly." Answers "1" to "3" were coded as "No" (= "I will not treat in the future") and answers "4" and "5" were coded as "Yes" (= "I will treat these patients in the future"). Orthodontists reported the number of patients treated with each characteristic. These numbers were categorized into "0 patients treated" = "No patients treated" vs "more than 0 patients treated" = "Yes, patients with this characteristic treated."

^c The orthodontists responded to the statement "My practice includes patients from all ethnic backgrounds" on a five-point scale. Responses "1" (= disagree strongly), "2" (= disagree) and "3" (= neutral) were coded as "No" (= "I will not treat in the future"). Responses "4" (agree) and "5" ("agree strongly") were coded as "Yes" (= "I will treat these patients in the future").

racial backgrounds and the least positive attitudes toward treating patients on Medicaid. It is therefore not surprising that the related behaviors were not overwhelmingly positive as well. The findings showed that only about a third of the residents and of the younger and older orthodontists provided care for patients on Medicaid. Interestingly enough, orthodontic residents were less likely to indicate that they would provide care for pro bono patients, for patients with craniofacial anomalies, and for patients with mental retardation than the practicing orthodontists. The hypothesis that a generational shift in a replacement of older cohorts of orthodontists would increase access to care for patients from these different groups was therefore not supported by the data. In addition, the hypothesis that female providers would practice in a more inclusive fashion was also not supported by the data, nor was the hypothesis¹⁹ supported that providers from non-European backgrounds would, overall, practice more inclusively than providers from European backgrounds. In summary, generational shifts will not be likely to drastically change the current situation.

In general, the data showed that professional attitudes and behaviors concerning specific groups of patients were correlated. Positive attitudes toward certain patient groups were related to an increased likelihood that providers treated patients from these

groups. The fact that the level of confidence concerning treating patients with craniofacial anomalies and patients with special needs was correlated with treating patients from these groups is noteworthy. It points to the possibility of increasing access to care for these patients by offering educational experiences that increase providers' confidence concerning treatment of these patients.²⁰ Increasing curricular efforts could increase confidence and, in turn, result in a greater likelihood of providing care for these patients.

One surprising finding was that while the residents expressed more positive attitudes toward treating patients on Medicaid, pro bono cases, patients with craniofacial anomalies, and patients with mental retardation, they did not actually intend to treat many of these patients. One potential explanation for this fact could be that these residents are keenly aware of the fact that the level of debt they face when entering into private practices will require them to maximize their earnings so that they can pay the debt they have accumulated both during predoctoral and graduate education.²¹ These considerations are crucial when considering how access to care could be increased.

One limitation of this study was that these findings are based on survey data. Social desirability considerations could have therefore shaped responses, and

Table 3. Professional Attitudes and Behaviors of European American and Non-European American Respondents

	European American	Non-European American	P
<i>Attitudes^a</i>			
<i>Different ethnic backgrounds</i>			
I like to treat patients from different ethnic backgrounds.	4.49	4.79	< .001
My practice (will) include(s) patients from ethnic backgrounds that are different from my own background.	4.67	4.75	.298
<i>Medicaid and pro bono cases</i>			
I like to treat patients on Medicaid.	2.08	2.72	< .001
I like to treat patients as pro bono cases.	3.54	3.45	.456
<i>Craniofacial anomalies and mental retardation</i>			
I like to treat patients with craniofacial anomalies.	3.10	3.30	.086
I like to treat patients with mental retardation.	2.79	2.77	.798
I am confident treating patients with craniofacial anomalies.	3.32	3.08	.054
I am confident treating patients with mental retardation.	3.28	3.06	.079
<i>Behavior^b (type of patients)</i>			
Patients from different ethnic backgrounds ^c	90%	97%	.004
Patients on Medicaid	36%	38%	.323
Pro bono cases	84%	67%	< .001
Patients with craniofacial anomaly	82%	69%	.002
Patients with mental retardation	81%	53%	< .001

^a The answers to the attitudinal items were given on five-point answer scales from 1 = "disagree strongly" to 5 = "agree strongly."

^b Residents responded to the questions concerning their behavioral intentions about treating patients with these characteristics on a scale from 1 = "disagree strongly" to 5 = "agree strongly." Answers "1" to "3" were coded as "No" (= "I will not treat in the future") and answers "4" and "5" were coded as "Yes" (= "I will treat these patients in the future"). Orthodontists reported the number of patients treated with each characteristic. These numbers were categorized into "0 patients treated" = "No patients treated" vs "more than 0 patients treated" = "Yes, patients with this characteristic treated."

^c The orthodontists responded to the statement "My practice includes patients from all ethnic backgrounds" on a five-point scale. Responses "1" (= disagree strongly), "2" (= disagree) and "3" (= neutral) were coded as "No" (= "I will not treat in the future"). Responses "4" (agree) and "5" ("agree strongly") were coded as "Yes" (= "I will treat these patients in the future").

behavior was self-reported. It would be feasible to conduct a study in which clinical charts in orthodontic practices would be analyzed according to how payment for the services were provided and which type of services were provided to which types of patients. Such a study would offer an opportunity to assess professional behaviors of orthodontists in a more objective manner.

CONCLUSIONS

- Orthodontic residents have more positive attitudes concerning treating pro bono cases, patients on Medicaid, patients with craniofacial anomalies, and patients with mental retardation than practicing orthodontists. However, they are less likely to intend to provide services for these patients than orthodontists.

Table 4. Correlations Between Professional Attitudes and Behaviors

Attitudes Towards:	Behavior Concerning Patients:				
	With Different Ethnic Background	On Medicaid	Pro Bono Cases	With Craniofacial Anomaly	With Mental Retardation
<i>Patients with different ethnic backgrounds</i>					
I like to treat patients from different ethnic backgrounds.	.28***	.02	.04	.07+	.003
My practice (will) include(s) patients from ethnic backgrounds that are different from my own background.	.48***	-.01	.06	.06	.08*
<i>Medicaid and pro bono cases</i>					
I like to treat patients on Medicaid.	.03	.49***	-.02	-.04	-.10*
I like to treat patients as pro bono cases.	.07+	.05	.42***	.13**	.13**
<i>Patients with craniofacial anomalies and mental retardation</i>					
I like to treat patients with craniofacial anomalies.	.06+	.16***	.08*	.27***	.05
I like to treat patients with mental retardation.	.07+	.04	.07+	.17***	.19***
I am confident treating patients with craniofacial anomalies.	.07+	.20	.11**	.36***	.19***
I am confident treating patients with mental retardation.	.09*	-.02	.05	.19***	.27***

+ $P < .10$; * $P < .05$; ** $P < .01$; *** $P < .001$.

- While female respondents had more positive attitudes toward Medicaid patients, they were less likely to accept pro bono cases than male respondents.
- Providers who were not of a European racial background agreed more strongly that they liked to treat patients from different ethnic/racial backgrounds and patients on Medicaid than white providers. However, they were less likely to accept pro bono cases and to provide care for patients with craniofacial anomalies and patients with mental retardation.
- Attitudes and professional behavior were correlated, as were the level of confidence in treating patients with certain special needs and providing care for these patients.

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