


Evaluation of factors that impact medical student consideration of a career in otolaryngology

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Abstract

Objective: To identify differences in timing of exposure and demographic characteristics between medical students who did and did not consider Otolaryngology as a career choice.

Methods: This cross-sectional study involved developing and distributing a survey by an interdisciplinary team to assess exposure to Otolaryngology and individual consideration of pursuing Otolaryngology. The survey was administered electronically to third- and fourth-year medical students at a single medical school, with a small monetary incentive for completion. Descriptive statistics, Fisher's exact tests, and logistic regression models were used for analysis.

Results: A total of 172 survey responses were collected out of 374 third- and fourth-year medical students (46%). A total of 74 (43.0%) respondents considered Otolaryngology during medical school. Exposure to Otolaryngology prior to medical school was significantly associated with choosing Otolaryngology (71.4%) compared to those who lacked exposure (28.6%) ($p = .048$). There was no significant gender difference among students who considered Otolaryngology ($p = .537$). However, our results showed significant differences between those who considered Otolaryngology by race ($p = .003$). Black/African American (OR = 0.11, 95% CI 0.01–0.99; $p = .049$) and Hispanic or Latino (OR = 0.14, 95% CI 0.03–0.65; $p = .012$) were less likely to consider Otolaryngology when compared to those identifying as White when adjusted for exposure prior to medical school.

Conclusions: Our results showed that early exposure and demographic background impact a student's decision to consider Otolaryngology as a career. These findings highlight the need for robust recruitment initiatives. Avenues like pipeline and mentorship programs are recommended to recruit and attract diverse applicants to Otolaryngology.

Level of Evidence: 3

KEYWORDS

career decision, demographics, medical student exposure

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1 | INTRODUCTION

Over the past decade, efforts to enhance diversity in medicine have led to modest improvements in the number of underrepresented in medicine (URiM) physicians. However, minority representation in Otolaryngology still remains significantly below the national average.¹ According to the American Medical Association, of the 10,109 otolaryngologists in the United States, only 20% are female; 2.4% identify as Black or African American; and 3.8% as Hispanic, Latino, or of Spanish origin.² The benefits of diversifying the physician workforce are multifaceted—for example, it leads to better patient outcomes and communication ratings from minority patients when their physicians share a similar racial or ethnic background and URiM physicians are more likely to work in underserved communities.^{3–8}

Promoting diversity in medicine can begin at the medical student level. Recent evidence indicates that one's choice of specialty is significantly influenced by the availability of clerkship experiences and mentors at medical schools, including within the field of Otolaryngology.^{9,10} Despite the importance of clerkship experiences and mentorship opportunities, many medical students graduate without formal clinical exposure within Otolaryngology, and formal mentorship programs are limited to a small number of medical schools.^{11,12} As a result, many students graduate without sufficient exposure to Otolaryngology compared to their peers applying into the field.¹³ This contributes to the challenge of increasing diversity and representation in Otolaryngology.

Few prior studies have explored students' demographic factors and initial exposure to Otolaryngology, and their impact on specialty choice. This study aims to: (1) identify differences in demographic characteristics between medical students who considered Otolaryngology as a career and those who did not; (2) identify differences in timing of exposure to Otolaryngology and their specialty of choice between medical students who considered Otolaryngology as a career and those who did not; (3) explore the role of mentorship in students' overall career decisions. By analyzing these factors, we aim to provide evidence to support institutional strategies and programs that can address disparities within Otolaryngology and encourage outreach to students.

2 | MATERIALS AND METHODS

This study received approval by the University of Michigan Institutional Review Board (IRB#: HUM00247314). Additional approval was granted by the Office of Medical Student Education (OMSE) Evaluation and Assessment Team for dissemination to the student body.

2.1 | Survey development

The survey was created and reviewed by a multidisciplinary team including board-certified physicians in Otolaryngology and Internal Medicine, along with medical students. The survey questions were

generated based on literature review and current practices at the medical school of interest. Prior to distribution, two students were sampled to complete the survey. Their feedback on readability and length was incorporated into the final draft of the survey. Based on this, the time to complete the survey was 5 min. The full survey is available in Appendix A.

2.2 | Survey distribution and incentives

The survey was made available via electronic mail list-serve to third-year and fourth-year medical students, including those on leaves of absence (LOA) and those completing dual degrees including medical scientist training program (MSTP, MD/PhD) degrees at a single institution. The survey was conducted via Qualtrics (Provo, Utah) from April 4, 2024, to June 4, 2024. Inclusion criteria were third- or fourth-year student status, having already decided on their specialty, and completion of the core clerkships. Core clerkships are required for all students and completed by the end of the second year of school (M2 year). At the time of the survey period, third-year students had 3–6 months remaining before the residency application deadline, while fourth-year students were either nearing graduation or had recently graduated. Incentives to participate in the survey included a \$5 gift card for each participant that filled out the entirety of the survey.

2.3 | Survey items

The survey was an 18-question form that investigated exposure to Otolaryngology, specialty of choice, and involvement in formal mentorship avenues. Survey items involved multiple choice options (Q4, Q6, Q7, Q8, and Q12) timeline scale response options (Q2, Q3, and Q5), 4 and 5-item Likert scale response options (Q9, Q10, Q11, and Q13) and the opportunity for open-ended responses (Q4, Q6, Q7, Q8, and Q12).

Age, gender, year in medical school and race were self-identified by respondents (Q14, Q15, Q16, Q17, and Q18). Responses for age included 20–24, 25–29, 30–34, 35–39, 40–44, and 45+ years of age. Gender was self-reported through a free-response option, with an additional item on transgender identity. Responses for year in medical school included MD/PhD, M4, M3, LOA, and Dual Degree. Responses for race included American Indian or Alaskan Native, Asian/Pacific Islander, Black or African American, Hispanic or Latino, White/Caucasian, Middle Eastern North African (MENA), and multiple ethnicities/a race or ethnicity not listed above (please specify) with an opportunity to leave a free text response.

2.4 | Data analysis

Descriptive statistics were employed to summarize patient demographic and exposure characteristics. Fisher's exact tests were used

for bivariate analyses. Univariate and multivariable logistic regression models were used to estimate odds ratios (OR's) and 95% confidence intervals for specific relationships.

Thematic content analysis was used for free-text responses to Q7 and Q12. Two members of the study team independently reviewed responses and identified prominent response categories. Identified categories were discussed broadly with the study team and agreed upon.

Statistical significance was set at $p < .05$ for all analyses. SAS software version 9.4 (Cary, NC) was used for all analyses and Microsoft Excel was used to create figures.

3 | RESULTS

3.1 | Baseline characteristics

A total of 172 out of 374 students responded (46%). There were five individuals who did not complete the entire survey and were excluded from the analysis. Most respondents were 25–29 years old ($n = 130$, 76%), female ($n = 120$, 70%), White/Caucasian ($n = 86$, 50%), or Asian/Pacific Islander ($n = 38$, 22%). There were 75 (44%) third-year respondents, 69 (40%) fourth-year respondents, 12 (7%) MD/PhD respondents, 9 (5%) LOA respondents, and 7 (4%) dual-degree respondents in the study. Baseline characteristics are summarized in Table 1.

3.2 | Specialty choice and exposure timing

A total of 129 respondents (75%) chose a core M2 specialty, while 43 (25%) chose a non-core M2 specialty, with 7 (4.1%) of those individuals choosing Otolaryngology. There were 155 respondents (90.1%) who were exposed to their chosen specialty by the end of M2 year. When asked when they finalized their decision to pursue their specialty, 50 respondents (29.1%) answered by the end of M2 year, and 122 respondents (70.9%) answered later than M2 year. Timing of first exposure after M2 year was associated with a significantly increased likelihood of choosing a non-core M2 specialty (OR 9.60, 95% CI 3.15 to 29.3; $p < .001$). Timing of finalizing specialty choice after M2 year was associated with a significantly increased likelihood of choosing a non-core M2 specialty (OR 4.07, 95% CI 1.50 to 11.06; $p = .006$). Specialties are characterized as core versus non-core in Table 2.

3.3 | Specialty choice and exposure to Otolaryngology

A total of 113 (65.7%) respondents had no exposure to Otolaryngology prior to medical school, and 133 (77.3%) respondents had no exposure to Otolaryngology during medical school other than first-year lectures and head and neck anatomy. Respondents who chose Otolaryngology as a specialty were more likely to have been exposed to Otolaryngology prior to medical school than respondents who did not choose Otolaryngology (71.4% vs. 28.6%; $p = .048$). Exposure to

TABLE 1 Characteristics of the sample.

Age (n, %)	
20–24	11 (6%)
25–29	130 (76%)
30–34	28 (16%)
35–40	3 (2%)
Gender n (%)	
Female	120 (70.0)
Male	43 (25.0)
Non-binary	1 (1.0)
Prefer not to say	8 (5.0)
Transgender identity n (%)	
No	170 (98.8)
Yes	2 (1.2)
Race n (%)	
White	86 (50.0)
Black or African American	8 (5.0)
Asian or Pacific Islander	38 (22.0)
Middle Eastern or North African	12 (7.0)
Hispanic or Latino	15 (9.0)
No response	2 (1.0)
Multiple ethnicities/a race or ethnicity not listed above	11 (6.0)
Class level n (%)	
Third year	75 (44.0)
Fourth-year	69 (40.0)
MD/PhD	12 (7.0)
LOA	9 (5.0)
Dual degree	7 (4.0)

Otolaryngology in medical school other than M1 lectures was not significantly associated with choosing Otolaryngology as a specialty (42.9% vs. 21.8%; $p = .193$). In the qualitative analysis of free-response answers, respondents who reported additional exposure were exposed most frequently through elective rotations and shadowing, and less commonly through combined cases with other surgical specialties.

3.4 | Demographic characteristics in those who consider Otolaryngology

Among respondents, 74 (43.0%) considered Otolaryngology during medical school. There were no significant age ($p = .071$) or gender ($p = .537$) differences among students who considered versus did not consider Otolaryngology (Table 3). However, significant racial differences were observed ($p = .003$). Black/African American (OR = 0.11, 95% CI 0.01–0.99; $p = .049$) and Hispanic or Latino (OR = 0.14, 95% CI 0.03–0.65; $p = .012$) were less likely to consider Otolaryngology compared to their White peers when adjusted for exposure prior to medical school (Table 4).

TABLE 2 Core and non-core M2 specialties.

	Specialty	n, (%)
<i>Core specialties</i> —Defined as specialties that medical students can rotate through prior to the end of their second year of medical school	Internal Medicine	27 (15.7)
	General Surgery	14 (8.1)
	Obstetrics and Gynecology	14 (8.1)
	Plastic Surgery	11 (6.4)
	Pediatrics	10 (5.8)
	Anesthesiology	10 (5.8)
	Neurology/Child Neurology	8 (4.6)
	Family Medicine	7 (4.1)
	Psychiatry	7 (4.1)
	Urology	6 (3.5)
	Medicine-Pediatrics	6 (3.5)
	Radiology	6 (3.5)
	Vascular Surgery	1 (0.6)
	Thoracic Surgery	1 (0.6)
	Pediatrics/Medical Genetics	1 (0.6)
<i>Non-core specialties</i> —Defined as specialties that medical students do not encounter until after their second year of medical school	Dermatology	11 (6.4)
	Orthopedic Surgery	9 (5.2)
	Otolaryngology	7 (4.1)
	Ophthalmology	6 (3.5)
	Emergency Medicine	3 (1.7)
	Radiation Oncology	3 (1.7)
	Pathology	2 (1.2)
	Neurosurgery	1 (0.6)
	Physical Medicine and Rehabilitation	1 (0.6)

3.5 | Patterns and sources of mentorship

Among respondents, 170 found mentors in their field (98.8%) with 24 (14.0%) involved in formal mentorship programs. Mentors were commonly found through M2 rotations (24.4%), M3 rotations (23.8%), and research (26.7%). Unsolicited (also known as “cold”) emails were a notable method for finding mentors according to qualitative analysis. There were 150 (87.2%) respondents who did not participate in a formal mentorship group, with the remaining 22 (12.8%) respondents citing participation in interest groups and pipeline programs.

4 | DISCUSSION

Our study highlights several important findings regarding the differences in characteristics, both demographic and exposure timing, in

students considering Otolaryngology. First, our data suggest that certain individuals, including Black/African American and Hispanic or Latino individuals, are less likely to consider Otolaryngology at our institution. These results align with broader trends indicating that underrepresented minorities are less likely to apply to Otolaryngology.¹⁴ The underrepresentation of minority groups in Otolaryngology is a significant concern that requires concerted efforts to address. Current literature identifies several barriers that medical students from diverse backgrounds face when considering Otolaryngology as a career. These include a lack of mentorship, limited exposure to the field, finances, and perceived cultural and institutional barriers.^{10,15} Similarly, there is evidence that shows URiM students perceive Otolaryngology residency programs as less welcoming or inclusive compared with other specialties.¹⁶

Increasing diversity within Otolaryngology is not just about equity but also about improving the overall quality of care provided. Studies suggest that patients tend to have better health outcomes and higher satisfaction when treated by physicians who share similar backgrounds or who are trained to provide culturally competent care.^{4,17,18} Addressing this is critical since a diverse physician workforce is not only associated with improved patient outcomes but enhanced patient satisfaction and more equitable access to care.^{3–6,19}

To address these disparities, several interventions can be considered. Our study showed that pre-medical school exposure to Otolaryngology is associated with higher likelihood of considering the specialty, bringing into question the possibility of early outreach to undergraduate students. Furthermore, Timothee et al. (2024) highlighted the significance of summer research programs focused on URiM students, as such programs can provide early exposure and foster an interest in specialties like Otolaryngology.²⁰ Moreover, Deivasingamani et al. (2022) discussed the success of structured mentorship programs in surgical residency matches, suggesting that similar initiatives could be beneficial in Otolaryngology.²¹ Mentorship and networking opportunities can help URiM students navigate the unique challenges they face and feel supported in their career aspirations. Additionally, institutional policies that promote diversity and inclusion, such as bias training and efforts to create a more inclusive residency environment, are crucial in attracting and retaining diverse talent.

Furthermore, our data show that many medical students lack exposure to Otolaryngology after first-year lectures and anatomy labs and might not have adequate training during medical school. This is consistent with a recent survey-based study distributed to medical schools in Canada which found that medical students generally do not receive adequate training in Otolaryngology.²² Adequate exposure to Otolaryngology is critical for ensuring students can make informed decisions about their careers.

Lastly, mentorship was an important factor that students sought out during their medical school training. Despite this, formal mentorship programs were not widely utilized. We know effective mentorship can have important influence on a student's career choice, and expanding mentorship and outreach opportunities could be an effective avenue for increasing specialty exposure to address demographic differences between those interested in Otolaryngology.^{23,24}

TABLE 3 Differences in demographic characteristics between applicants who did and did not consider Otolaryngology.

	Not considered at all (n = 98)	Considered (n = 74)	p-value
Race			.003
Asian/Pacific Islander	23 (23.5%)	15 (20.3%)	
Black or African American	7 (7.1%)	1 (1.4%)	
Hispanic or Latino	13 (7.6%)	2 (2.7%)	
Middle Eastern or North African	10 (10.2%)	2 (2.7%)	
Multiple or not listed	5 (5.1%)	6 (8.1%)	
White or Caucasian	40 (40.8%)	46 (62.2%)	
Age			.071
20–24	10 (10.2%)	1 (1.4%)	
25–29	69 (70.4%)	61 (82.4%)	
30–34	17 (17.4%)	11 (14.9%)	
35–39	2 (2.0%)	1 (1.4%)	
Gender			.537
Female	71 (72.5%)	49 (66.2%)	
Male	22 (22.5%)	20 (27.0%)	
Non-binary	0 (0%)	1 (1.4%)	
Prefer not to respond	5 (5.1%)	3 (4.1%)	

TABLE 4 Logistic regression models for predictors of considering Otolaryngology.

	Unadjusted		Adjusted ^a	
	OR and 95% CI	p-value	OR and 95% CI	p-value
Race (vs. White)				
Asian/Pacific Islander	0.57 (0.25–1.23)	.152	0.67 (0.30–1.47)	.319
Black or African American	0.12 (0.02–1.05)	.056	0.11 (0.01–0.99)	.049
Hispanic or Latino	0.13 (0.03–0.63)	.011	0.14 (0.03–0.65)	.012
Middle Eastern or North African	0.17 (0.04–0.84)	.030	0.21 (0.04–1.04)	.056
Multiple or not listed	1.04 (0.30–3.68)	.947	0.96 (0.26–3.52)	.946
Age (vs. 25–29)				
20–24	0.11 (0.01–0.91)	.040	0.13 (0.02–1.07)	.058
30–34	0.73 (0.32–1.68)	.463	0.73 (0.31–1.72)	.476
35–39	0.57 (0.05–6.39)	0.645	0.60 (0.05–7.04)	.687
Gender (vs. male)				
Female	0.76 (0.38–1.54)	.445	0.68 (0.33–1.42)	.305
Non-binary ^b	n/a			
Prefer not to respond	0.66 (0.14–3.12)	.600	0.76 (0.16–3.66)	.732

^aAdjusted for exposure prior to medical school.^bUnable to run model for non-binary gender due to complete separation.

This study is subject to several limitations. The electronic mail survey design may have introduced response bias, and the single institution focus limits the generalizability of the findings. Furthermore, our sample had an overrepresentation of female and White respondents compared to the broader medical student population.²⁵ Future research would benefit from larger, multi-institutional studies to validate our findings and explore additional factors influencing specialty choice. Qualitative research examining the specific barriers and motivators underlying specialty decisions for students from diverse demographic backgrounds could

provide valuable insights into improving recruitment and support strategies.

5 | CONCLUSION

This single-institution study showed medical students differed in their consideration of pursuing Otolaryngology based on demographic and exposure characteristics. These findings highlight the need for robust recruitment initiatives. The results also highlighted the importance of

mentorship. Avenues like pipeline and mentorship programs are recommended to recruit and attract diverse applicants to the field of Otolaryngology.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

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APPENDIX A

A.1 | EARLY EXPOSURE TO SPECIALTIES AND EFFECT ON RESIDENCY CHOICE

Start of Block: Student Satisfaction

Instruction Thank you for participating in this survey. There are 19 total questions and the survey takes about 5 min. Please email mhkress@umich.edu with any concerns, questions, or comments regarding the survey.

Q1 What specialty have you applied into/plan to apply into?

Q2 When did you first become interested in pursuing your field of interest?

- Before medical school started (1)
- First half of M1 year (2)
- Second half of M1 year (3)
- First half of M2 year (4)
- Second half of M2 year (5)
- First half of M3 year (6)
- Second half of M3 year (7)
- First half of M4 year (8)
- During a Dual Degree Program or LOA (10)

Q3 When was your first exposure to your field of interest?

- Before medical school started (1)
- First half of M1 year (2)
- Second half of M1 year (3)
- First half of M2 year (4)
- Second half of M2 year (5)
- First half of M3 year (6)
- Second half of M3 year (7)
- During a Dual Degree Program or LOA (8)

Q4 How did you first become exposed to your specialty of choice?

- Lecture during M1 year (1)
- Lecture during M2 year (2)
- Shadowing (3)
- Club event during medical school (4)
- Core clerkship rotations (5)
- Elective rotations (6)
- Research Project (7)
- Volunteering (8)
- Personal experience as a patient (or family/friend of a patient) (9)
- Family/friend in the field (11)
- Talking with faculty/residents/peers (12)
- Other: (10) _____

Q5 When did you finalize your decision to pursue your specialty?

- Before medical school started (1)
- First half of M1 year (2)
- Second half of M1 year (3)
- First half of M2 year (4)
- Second half of M2 year (5)
- First half of M3 year (6)
- Second half of M3 year (7)
- During a Dual Degree Program or LOA (8)

Q6 What event/experience confirmed your decision to pursue your specialty?

- Lecture (1)
- Rotation within the field (2)
- Research (3)
- Other: (4) _____

Q7 How did you find mentors in your particular specialty?

- M1 curriculum (5)
- M2 core rotations (9)
- M3 rotations (6)
- Research (7)
- Clubs/extracurriculars (8)
- Formal mentorship program (10)
- Other: (3) _____

Q8 Were you involved in any formal mentorship program in your field of interest (i.e., General Surgery (Anastomosis), Ophthalmology (Michigan Ophthalmology Pipeline), Urology (UroVersity), and Dermatology (Dermatology Pipeline Program), etc.)?

- Yes (please indicate which one) (1) _____
- No (2)

Q9 How much do you know about the field of Otolaryngology?

- None at all (1)
- A little (2)
- A moderate amount (3)
- A lot (4)
- A great deal (5)

Q10 How familiar were you with Otolaryngology prior to beginning medical school?

- Not familiar at all (1)
- Slightly familiar (2)
- Moderately familiar (3)
- Very familiar (4)
- Extremely familiar (5)

Q11 Did you have any exposure to Otolaryngology prior to beginning medical school?

- None (1)
- A little (2)
- A moderate amount (3)
- A decent amount (4)
- A great amount (5)

Q12 Did you have any further exposure to Otolaryngology in medical school other than M1 lectures?

- Yes (please indicate how): (1) _____
- No (2)

Q13 How much did you consider specializing in Otolaryngology?

- Not at all considered (1)
- Slightly considered (2)
- Moderately considered (3)
- Very much considered (4)
- Extremely considered (5)

Q14 What year in medical school are you?

- M3 (1)
- M4 (2)
- Dual Degree (3)
- LOA (4)
- MD/PhD (5)

Q15 Which race or ethnicity best describes you? (Please choose only one.)

- American Indian or Alaskan Native (1)
- Asian/Pacific Islander (2)
- Black or African American (3)
- Hispanic or Latino (4)
- White/Caucasian (5)
- MENA (Middle Eastern or North African) (6)
- Multiple ethnicity/a race or ethnicity not listed above (please specify) (7)

Q16 What is your age?

- 20–24 (1)
- 25–29 (2)
- 30–34 (3)
- 35–39 (4)
- 40–44 (5)
- 45+ (6)

Q17 To which gender identity do you most identify?

- Fill in: (1) _____
- Prefer not to answer (2)

Q18 Do you identify as transgender?

- Yes (1)
- No (2)

Q19 Thank you for completing this survey. Please enter an email address to which we can send the gift card:

End of Block: Student Satisfaction