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Effect of Application Screening Methods on Racial and Ethnic Diversity in Otolaryngology

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Abstract

Otolaryngology–head and neck surgery (OHNS) lags behind other surgical subspecialties in the representation of underrepresented minorities in medicine (URMs). Given the recently announced changes to Step 1 scoring, we aimed to assess the effect of alternative application screening methods—Step 2 Clinical Knowledge scores and Alpha Omega Alpha membership—on the racial/ethnic diversity of the OHNS applicant pool. After reviewing OHNS residency applications submitted to our institution for the 2015-2020 matches (N = 2177), we determined that a significantly greater proportion of URM vs non-URM applicants would be screened out from interview consideration if any the following were used as an initial screening method: Step 2 cutoff score of 240, Step 2 cutoff score of 253 or non–Alpha Omega Alpha membership ($P < .01$ for each). Given that using these metrics to screen applications disproportionately affects URMs, programs should consider implementing alternative application review methods, such as holistic evaluation, which may promote more equitable distribution of interviews.

Keywords

otolaryngology, residency, applications, underrepresented minorities, medical student

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In 2020, the United States Medical Licensing Examination sponsors announced a change in Step 1 examination scoring from numeric scoring to pass/fail.[1] This decision was made in part to reduce the present overemphasis on Step 1, as the examination has not been associated with success as a resident despite its frequent use in residency selection.[2-5] Moreover, studies have shown that a reliance on Step 1 scores during residency selection disproportionally affects underrepresented minorities in medicine (URMs), further supporting the decision.[6-9]

This change presents a challenge for otolaryngology–head and neck surgery (OHNS). OHNS residency programs frequently receive far more applications than they have interviews to offer, leading some to rely on Step 1 scores to screen applications initially.[4,5] With this planned change in Step 1 scoring, some programs may need to develop new methods for reviewing applications, which for some may include using a different applicant metric.

It is important to consider how such changes might affect racial/ethnic diversity, as OHNS continues to lag behind other surgical subspecialties despite studies showing that increasing the diversity of the physician population can help improve health disparities.[10-15] Thus, this study aimed to assess the effect of alternative screening methods—namely, Step 2 Clinical Knowledge scores and Alpha Omega Alpha (AOA) membership status—on the racial/ethnic diversity of the OHNS applicant pool.

Methods

This study was conducted with the approval of the University of North Carolina Institutional Review Board. Electronic Residency Application Service applications submitted to our OHNS residency program between the 2014-2015 and 2019-2020 application cycles were reviewed. Applicants' race/ethnicity, Step 1 and 2 scores, and AOA membership status were extracted from each application. Self-identified race/ethnicity was grouped into URM vs non-URM. URM was defined as Black/African American, Hispanic/Latino, Native American/Alaskan Native, or Hawaiian/Pacific Islander.[16] Non-URM was defined as White, Asian, other, or unknown.

Screening methods evaluated included Step 2 scores below the mean (253) and 1 SD below the mean (240), as well as non-AOA membership. Step 1 scores at the mean (246) and 1 SD below the mean (233) were also included for comparison. The percentage of URM and non-URM applicants who would be categorically screened out of consideration

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for interview with each method were compared with a chi-square test. Statistical significance was set a priori at $P < .05$. Statistical analysis was performed with Stata 16 (StataCorp).

Results

In total, 2177 applications were reviewed, accounting for 89.6% of all OHNS residency applications to programs in the Match during the study period.[17-22] Of these, 10.3% (n = 225) belonged to URMs (**Table 1**). The mean Step 2 score was 253.1 (SD, 12.9), 247.4 (SD, 14.6) for URMs, and 253.8 (SD, 12.5) for non-URMs.

A Step 2 cutoff score 1 SD below the mean (240) led to the screening out of 26.8% of URMs from interview consideration, as opposed to only 12.3% of non-URMs ($P < .01$; **Figure 1**). Meanwhile, a cutoff score of 253 resulted in the screening out of 61.1% of URMs vs 40.7% of non-URMs ($P < .01$). These findings are very similar to those for Step 1 cutoff scores 1 SD below the mean (233; URM, 25.3%; non-URM, 12.6%; $P < .01$) and at the mean (246; URM, 62.2%; non-URM, 40.5%; $P < .01$). Additionally, non–AOA membership resulted in the screening out of 72.1% of URMs vs 56.0% of non-URMs ($P < .01$).

Discussion

The planned change in Step 1 scoring may lead residency programs to use other metrics to perform initial screening of applications. Our study revealed that using Step 2 cutoff scores or membership in AOA as screening methods can negatively affect URMs by leading to a disproportionate exclusion of these applicants from interview consideration, thus potentially perpetuating the disparities in physician representation that already exist in the field.[10] Our findings align well with those of previous studies, quantifying the impact of a Step 2 screening method on diversity in OHNS and expanding on the effect of other applicant metrics.[6-9,23]

Rather than using single-point screening metrics, programs should consider utilizing alternative methods of reviewing applications, such as holistic evaluation, even though they may be more time intensive. One example is by implementing an algorithm similar to the one described by Villwock et al, which reduced time spent reviewing applications without significantly altering the composition of the applicant pool.[24] If an alternative method is implemented, programs should perform studies to evaluate its feasibility and its impact on applicant pool diversity during residency selection.

One limitation of this study is that in the past, Step 2 has not been a strongly considered metric in the residency application, a fact well known to applicants.[5] As a result, the Step 2 scores used for the analysis herein may not be representative of the scores that may arise following the Step 1 scoring change. Another limitation is that this study did not control for factors such as socioeconomic status, which may contribute to the disproportionate effects of Step 2 cutoff scores and AOA membership on URMs, though this would be an interesting topic for future studies.

Table 1. Applicant Characteristics.

	No. (%) or mean ± SD
Applicants	2177 (100)
Race/ethnicity	
URMs	225 (10.3)
Black/African American	82 (3.8)
Hispanic/Latino	132 (6.1)
Native American/Alaskan Native	6 (0.3)
Hawaiian/Pacific Islander	5 (0.2)
Non-URMs	1952 (89.7)
White	1015 (57.2)
Asian	509 (23.4)
Other	2 (0.1)
Unknown	158 (7.3)
Step 1 scores	
Reported	2164 (99.4)
Not reported	13 (0.6)
Mean for all reported	245.9 ± 13.0
For URMs	239.7 ± 14.9
For non-URMs	246.7 ± 12.6
Step 2 Clinical Knowledge scores	
Reported	1875 (86.1)
Not reported	302 (13.9)
Mean for all reported	253.1 ± 12.9
For URMs	247.4 ± 14.6
For non-URMs	253.8 ± 12.5
AOA membership	
Reported	1766 (81.1)
Not reported	411 (18.9)
AOA membership status	
AOA member	750 (42.5)
Non–AOA member	1016 (57.5)

Abbreviations: AOA, Alpha Omega Alpha; URMs, underrepresented minorities in medicine.

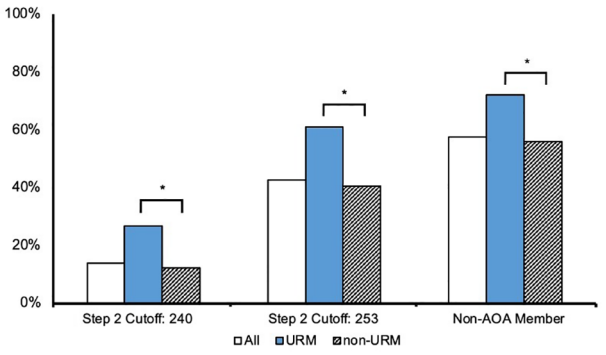

Figure 1. Percentage of applicants screened out based on Step 2 cutoff score and non-AOA membership. *$P < .05$. AOA, Alpha Omega Alpha; URM, underrepresented minority in medicine.

Conclusion

When used as initial screening methods, metrics such as Step 2 scores and AOA membership negatively affect the racial/

ethnic diversity of the OHNS applicant pool. Programs should consider using alternative methods of reviewing applications, such as holistic evaluation, which may facilitate more equitable distribution of interviews.

Author Contributions

Christina Dorismond, substantial contribution to the conception and design; acquisition, analysis, and interpretation of data; drafting and revising; final approval; accountability for all aspects of the work; **Zainab Farzal**, substantial contribution to the design, revising, final approval, accountability for all aspects of the work; **Rupali N. Shah**, substantial contribution to the design, revising, final approval, accountability for all aspects of the work; **Charles S. Ebert Jr**, substantial contribution to the design, revising, final approval, accountability for all aspects of the work; **Robert A. Buckmire**, substantial contribution to the conception and design, acquisition of data, revising, final approval, accountability for all aspects of the work.

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