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Factors Associated With Osteopathic Primary Care Residency Choice Decisions

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**Context:** The osteopathic medical profession traditionally emphasized the education of primary care physicians. A common thread for both osteopathic and allopathic residency matches, however, has been an increase in the interest in specialties outside of primary care.

**Objective:** To determine whether there are critical points in medical school associated with residency selection decision-making, what factors affect residency selection decisions, and whether any identifiable shifts or trends exist.

**Methods:** This mixed-methods study sequentially used qualitative and quantitative research approaches. The study population was a convenience sample of osteopathic medical students, interns and residents, and practicing physicians from partner medical schools, associated hospitals, and a regional association of osteopathic physicians. In the first phase, interviews and focus group discussions were analyzed for codes, categories, and themes relating to factors that influence residency selection. In the second phase, a survey was created from the results of the first phase and administered to study participants.

**Results:** Of the 3450 potential participants, 282 completed the survey. Ninety-one of 209 participants (43.5%) indicated that the third year of medical school was the time they will or did decide what type of residency program to pursue. There were no significant differences in the mean scores between the respondent groups (ie, students, residents, and physicians) when ranking the importance of the 10 influential factors associated with residency selection decision-making ($P>.05$ for all).

**Conclusion:** The highest percentage of participants indicated the third year of medical school was the time that they made residency selection decisions regarding what specialty they were interested in entering. No shifts regarding the importance of specific primary care residency choice factors were found between training status of respondents.

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The osteopathic medical profession has traditionally focused on and continues to emphasize the importance of pursuing careers in primary care specialties to address the increasing need for such physicians in the current health care system.\textsuperscript{1-4} The past several decades have seen a continued increase in the number of students entering both osteopathic and allopathic medical schools.\textsuperscript{1-4} However, the proportion of medical school graduates entering residency in primary care specialties and, subsequently, practicing in these specialties is declining.\textsuperscript{1,5-9} The 2012 osteopathic graduate medical education (GME) match report\textsuperscript{10} revealed that osteopathic residency programs were not immune to this trend. In 2012, it was reported that 2372 of 2655 available osteopathic GME residency positions were first-choice programs, yielding a 0.89 ratio of first-choice applicants per position available.\textsuperscript{10} For primary care specialties, 1001 of 1360 positions were first-choice programs, yielding a first-choice to available position ratio of 0.74. Of 1766 total matches, 874 were in primary care specialties.\textsuperscript{10} These numbers suggest that even in programs accredited by the American Osteopathic Association, residency slots in primary care specialties remained unfilled each year and are only sometimes filled in the postmatch “scramble.”

On the allopathic side, the National Residency Match Program (NRMP) report of 2012\textsuperscript{11} indicated that more than 95% of residency positions were filled in primary care specialties. Osteopathic medical students who applied through the NRMP chose these specialties in relatively higher proportions.\textsuperscript{11} Cumulatively, the number of osteopathic medical students aspiring to specialties outside of primary care in the NRMP report was also high (approximately 68%). The decreased interest from osteopathic medical students in pursuing careers in primary care specialties amounts to capacity underuse, which necessitates the development of strategies that could potentially increase students’ interest in practicing in primary care.

The literature regarding residency choices spans more than 4 decades, but the medical education landscape has evolved over the years. The new landscape has been characterized by issues regarding medical education funding, length of training, physician lifestyle, practice regulations, increasing costs to hospitals for resident training, and quality-based reimbursements, among others. Consequently, these developments likely have untoward effects on the thought processes of students with regard to residency selection. The effect that the following factors have on allopathic medical students’ residency selection have been studied: first clinical experiences,\textsuperscript{12} sequence of rotations,\textsuperscript{12,13} early exposure to and time spent in primary care settings,\textsuperscript{13-15} clerkship scores,\textsuperscript{13} faculty role models,\textsuperscript{12,16,17} and student demographics, such as gender\textsuperscript{14-16,18-20} and geographic location (rural vs urban origin).\textsuperscript{14,19,20}

Regarding osteopathic medical students, however, there is a dearth of literature on factors that influence the residency choice decision-making process. The few available studies\textsuperscript{4,9} did not comprehensively examine the factors that affect residency selection. Moreover, the 2014 agreement involving the American Osteopathic Association (AOA), the American Association of Colleges of Osteopathic Medicine, and the Accreditation Council for Graduate Medical Education (ACGME) to transition to a single accreditation system for GME by 2020 serves as a catalyst driving the need for a comprehensive understanding of the factors relating to residency selection in primary care specialties within osteopathic medical education.

It is important to explore the factors that affect osteopathic residency choice to begin to determine whether the single accreditation system may influence osteopathic medical students in selecting primary care residencies. These findings could provide a lens through which osteopathic medical education administrators and policy makers could evaluate strategies that would elevate interest in residencies in primary care specialties. Furthermore, it is useful to investigate whether critical time points are associated with when students make their decisions about residency program choices. Many medical students have a particular specialty in mind after their second year of medical school, but a large
proportion change their minds regarding their residency preferences and ultimate match. Understanding the dynamics of residency selection, therefore, can provide an opportunity for hospitals with GME programs to enhance the quality of educational experiences in desired primary care areas. The enhancements would hopefully attract, recruit, and retain the best caliber of trainees.

The objectives of this study were to determine whether there are critical points in osteopathic undergraduate medical education that affect residency selection decision-making; to elicit the factors that influence residency selection of osteopathic medical students, interns and residents, and practicing physicians; and to explore any identifiable shifts or trends in the importance of specific residency factors on residency choices in the osteopathic medical profession. We hypothesized that critical points of residency decision exist, as well as shifts in the importance of residency selection decision-making factors across the continuum of the osteopathic medical profession.

Methods

This mixed-methods study used qualitative and quantitative research approaches sequentially. The study population included medical students, interns, residents, and practicing physicians from 3 participating osteopathic medical schools, associated partner residency hospitals, and a regional association of osteopathic physicians. Institutional review board (IRB) approval was obtained for the study from the Ohio University’s IRB and from the IRB of each participating institution, as applicable.

Qualitative data were collected through 1 on 1 interviews and focus groups to create the survey. We solicited participants via email and word of mouth. The sample was a self-selected convenience sample. Interview and focus group scripts were developed from a critical literature review and a retrospective review of administrative data from a community teaching hospital to maintain consistency of questions. Three qualitative researchers (G.Y.D., K.C., and G.D.B.) conducted the focus group discussions and interviews and analyzed the data. Interviewees and focus group participants were selected from the study population. There were 51 focus group participants and 3 interview participants. Interviews and focus group discussions were documented through audio recordings and descriptive analytic field notes, and they ranged from 30 to 60 minutes.

Nine focus group sessions and 3 interviews were conducted. Each focus group was composed of 4 to 6 participants from the study population who volunteered to participate. Participants from the regional association of osteopathic physicians were excluded from the focus groups. Interviews, focus group discussions, and descriptive analytic field notes were transcribed and coded, and underlying themes that highlighted residency choices or preference factors were derived. Coding was done manually as well as using NVivo 10 software (QSR International). Comparisons were made between the manually extracted codes, categories, and themes and those generated by NVivo version 10 to extract the 10 final themes used in the survey. The 3 qualitative researchers independently examined the transcripts and developed codes, categories, and themes with eventual comparison to the NVivo results. This process was iterative, involving constant comparisons and consensus building until such time that no new themes emerged. At this point of saturation, further categories and themes became repetitive and redundant. The 10 factors of residency choice derived were societal and health policy changes, performance during clerkship, the matching process, financial considerations, mentor or preceptor influences, rotations, personality traits or self-concept, location preference or geography, work/life balance, and characteristics of the program.

Quantitative data were obtained from the survey that was developed based on data from the review of the literature, interviews, and focus group discussions. Experts in GME with psychometric training reviewed the survey items for face and content validity. The survey included 75 items, and responses were rated on a 5-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). Demographic and
other attributive variables, such as age, current training status, and whether participants succeeded in securing their first-choice residency program were also collected. Participants were also asked to rank the 10 previously defined factors that contribute to residency selection on a scale of 1 (“most important”) to 10 (“least important”). Although these scales were ordinal, they were used as mean summated scales in the final data analysis. When used in that context, they are treated as continuous variables. The survey was administered electronically via SurveyMonkey to the same population from which the participants in the qualitative phase were drawn. The link to the survey was sent to contacts within each of the participating institutions to distribute to potential participants in fall 2013 through spring 2014. Over this period, 3 follow-up reminders were sent to the participants.

Survey results were analyzed using descriptive statistics involving frequencies and percentages for categor-ic variables, as well as means and SDs for continuous variables. Analysis of variance was used for inferential statistical analysis to gauge group differences with regard to the mean scores of the residency choice factors delineated. Partially completed surveys were included in the analysis. Item analysis was conducted to determine the internal consistency reliability of the survey items (Cronbach \( \alpha = 0.886 \)). Statistical significance was set at \( P \leq 0.05 \).

Results

Of the 3450 potential participants, 282 completed the survey (8% response rate). The participants were predominantly white (91.9%), women (52.4%), and medical students (75.7%) (Table 1). Table 2 shows responses to survey items regarding when residency choices were made, the time available between clinical

<table>
<thead>
<tr>
<th>Table 1. Selected Characteristics of Participants in a Survey Regarding Factors Associated With Osteopathic Primary Care Residency Choice Decisions</th>
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</thead>
<tbody>
<tr>
<td>Demographic Characteristic</td>
</tr>
<tr>
<td>Race/Ethnicity (n=210)</td>
</tr>
<tr>
<td>Asian</td>
</tr>
<tr>
<td>Black</td>
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<tr>
<td>Hispanic</td>
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<tr>
<td>Native American</td>
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<tr>
<td>White or Caucasian</td>
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<td>Sex (n=210)</td>
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<tr>
<td>Female</td>
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<tr>
<td>Male</td>
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<tr>
<td>Training Status (n=214)</td>
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<tr>
<td>Medical student</td>
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<tr>
<td>Intern</td>
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<tr>
<td>Resident</td>
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<td>Attending physician</td>
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| Variable                                      | No. (%)   |
| Time of Residency Decision (n=209)            |           |
| High school                                   | 9 (4.3)   |
| Premedical school                             | 20 (9.6)  |
| Medical school                                |           |
| First year                                    | 13 (6.2)  |
| Second year                                   | 11 (5.3)  |
| Third year                                    | 91 (43.5) |
| Fourth year                                   | 34 (16.3) |
| Other                                         | 31 (14.8) |

| Time Availability Up to Matching During Medical School (n=210) |
| Adequate                                                    | 127 (60.5)|
| Inadequate                                                  | 83 (39.5) |

| Exposures to Different Specialties During Medical School (n=210) |
| Facilitates residency program choice                         | 117 (55.7)|
| Does not facilitate residency program choice                  | 93 (44.3)  |
years and matching, and the influence of exposure to different specialties. The highest percentage of participants indicated that they made their residency selection decision during their third year of medical school (91 of 209 [43.5%]).

Table 3 provides the mean response values of the survey items that asked participants to rank the factors associated with residency selection by level of importance. Response values ranged from 1 to 10, where 1 represented the highest level of importance and 10 represented the lowest. Based on the overall mean (SD) survey scores for items relating to the factors associated with residency selection, the 5 most important factors were the following: (1) characteristics of the residency program; (2) work/life balance; (3) location preference; (4) personality traits or self-concept; and (5) clinical rotations (3.82 [3.08], 4.08 [2.76], 4.50 [2.61], 4.67 [2.59], and 5.19 [2.53], respectively). The 5 factors ranked as most important by students, residents, and physicians were the same, but the specific order differed for physicians (Table 3). No significant differences were found in the mean (SD) scores across the respondent groups (P>.05 for all).

### Discussion

Primary care residency choice for osteopathic medical students is rooted in the history and philosophy of osteopathic medicine. The results of the current study show that the third year of medical school was the time when the highest percentage of participants reported deciding on the type of residency program they would pursue. This finding supports other studies. Further research is needed to confirm this finding so that interventions can be implemented to increase the number of osteopathic medical students in primary care residencies. An important factor in residency decision-making noted in the literature has been the exposure of medical students to different specialties during medical school. In the current study, the
majority of respondents agreed that exposure to different specialties gave them clarity in their decision-making process.

The results of the survey showed that for all of the 10 factors that influenced residency choice, no statistically significant differences were found between student, intern and resident, and physician responses, which suggests that there were no shifts in the importance of factors associated with primary care residency choices between training status. This finding suggests that time-tested strategies for increasing student interest in pursuing medical careers could still be examined to increase interest in primary care specialties. The factor participants identified as the most important in influencing residency selection—characteristics of a residency program—has been widely discussed in the literature, and there are conflicting conclusions regarding its significance in residency decision-making.27,28 Residency program characteristics that are important to medical students when choosing a program include preference for unopposed residency (especially for family medicine), academic environment and rigor, reputation of faculty, commitment of attending physicians to residency training in community hospital settings, employment benefits provided by the hospital, and whether residents are compensated additionally for doing work beyond regular schedules.7,16,28,40

Geographic location of the residency program was the next most important factor based on the overall survey scores. The importance of geographic location in residency selection was consistent with previous studies.28-32 A plausible explanation would be that the study participants had already been living and working in rural or medically underserved areas.33 The importance of geographic location would suggest that medical schools may have to place weight on the geographic preferences as well as origins of medical students during recruitment. Students from rural and underserved areas who desire and elect to train in and return to those areas should be encouraged to do so.

Another highly ranked factor in terms of importance when making a residency selection in the current study was work-life balance, which the literature has associated largely with non–primary care specialties.9,24,34 In a study by Laponis et al,35 work-life balance was a highly ranked factor in choosing primary care specialties. More than 90% of the survey respondents were associated with primary care or intended to pursue careers in primary care specialties in the case of medical students.35 In line with other studies,25,34 personality traits or self-concept were shown to be associated with residency choice in the current study.

Medical students with personality types that are more empathetic and humanistic are more likely than others to pursue primary care specialties.15,25,36 Prematriculation admission interviews in the participating osteopathic medical schools screen candidates for personality traits such as humanism, empathy, and suitability for primary care specialties. For effective screening, formal administration of psychological instruments should be deployed, results should be monitored longitudinally, and evidence should be examined to ensure that candidates with the best fit are selected. Studies12,37-39 have shown that the number and sequence of rotations during clerkships in specialties outside of primary care predicted residency choices. Contrary to those studies, the number and sequence of rotations did not rank in the topmost 5 factors for primary care specialties in the current study, which was in line with other studies.14,40-42

Among the bottom 5 influential factors in the current study, clinical experience was ranked highest. Mentors or preceptors often influence students through the role-model effect during clinical experiences. Thus, mentors’ professional behavior and clinical enactments affect students’ residency choice decisions.12,15,24,43,44 Interactions with a clinical faculty member could reinforce or alter students’ aspirations of residency preferences.44

Another factor that we expected to rank topmost but was in the bottom 5 factors was debt. Medical school debt is constantly increasing, and average student debt loads were reported to be in excess of $150,000 in 2015.28 Studies have shown that financial bonuses,
rewards, reimbursements, and remuneration would attract students to primary care.\textsuperscript{9,45} However, the finding in the current study was consistent with some studies in which financial considerations were hardly reported as among the most compelling factors for residency selection in primary care specialties.\textsuperscript{12,46,47} One plausible explanation for this finding may be that high-paying subspecialties exist, and students may have those subspecialties in mind when they choose primary care.\textsuperscript{47} Indeed, results of studies about the importance of debt burden on medical students’ career choice has been perverse, as there has been no clear conclusion drawn.\textsuperscript{48,49}

Although not among the top-5 important factors regarding residency selection, the matching process cannot be overlooked completely. Even if a trainee’s preferred choice is a specialty outside of primary care, that choice is realizable only if there is a match. Therefore, the matching process forces a convergence between residency choice aspirations and realities.\textsuperscript{4} In this regard, the matching process serves as a filter that places a limitation on desired or aspirational residency choice.\textsuperscript{43} Scores on the Comprehensive Osteopathic Medical Licensing Examination-USA or the United States Medical Licensing Examination play a significant role in bringing synchrony between aspirations and reality in the residency selection process. However, perhaps it was not ranked among students’ top-5 important factors because it is not entirely within their control.

Studies\textsuperscript{36,40,51,52} have shown that performance during clerkship years is critical to residency selection, but it was also not ranked in the top-5 important factors in residency selection. Students should be given a clearer view of the wide array of residency options available during those years.\textsuperscript{47,51} Performance during clerkship was a generic theme, and its interpretation was uniform across the board for all respondents by institution and organization. It was understood, as all assessment and evaluation outcomes that were reported about a trainee during clerkship, including direct observation, written examination scores, or standardized patient examinations scores. Performance measures might be different from institution to institution, as well as from generation to generation, but the construct of clerkship performance was understood in the same way among and across all the respondents in this study.

Although the survey was subjected to face and content validity by a team of experts in medical education with training in psychometrics, lack of a more rigorous and scientific validation, such as factor analysis, may detract from the generalizability of the results. Moreover, the factors identified may change over time. Nonetheless, through item analysis, the results showed high internal consistency reliability of the survey items. The results may not be generalizable to the entire osteopathic medical profession because only a few institutions participated in the study and because of the low response rate from the participating institutions. Hence, the inherent survey bias and the potential lack of representation due to the regional nature of the data collected could also detract from the generalizability of the results. Our focus on primary care specialties may mask innate differences in its subspecialties. Further studies of this type may be warranted to arrive at factors that consistently inform residency choice decisions among medical students. Unequal group sample sizes and the small sample of residents and practicing physicians could also bias the results. Missing data from incomplete surveys may have also caused bias in the results.

In light of our findings, future studies may be needed to explore intervention strategies in the third year of medical school to expose students to residency characteristics in primary care specialties that would pique their interest and possibly influence their residency selection. Increasing students’ interest in primary care to fill the existing gap would require deliberate policies at the institutional, state, and national levels. These policies should be harmonized to create incentives and rewards that bring congruence between the needs of the individual students, medical education institutions, and the public.
Conclusion
The highest percentage of participants considered their third year of medical school as the time that they finalized their residency choice. No identifiable shifts or trends regarding the importance of specific residency factors on residency choices were found between respondent groups, suggesting that time-tested strategies such as promoting primary care, increasing incentives through debt forgiveness, and favorable reimbursement mechanisms could still be examined in tandem with new innovations to increase students’ interest in primary care specialties.

Author Contributions
All authors provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; all authors drafted the article or revised it critically for important intellectual content; all authors gave final approval of the version of the article to be published; and all authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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