Education
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Choosing surgery as a career: Early results of a longitudinal study of medical students

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Background. *Few studies have explored the factors associated with the preference of medical students to pursue a specific specialty, and even fewer have observed how these preferences and factors change over time.*

Methods. *A longitudinal survey of medical students was administered at the beginning of first year, second year, and clerkships from 2013–2016. Surveys included demographics and factors associated with their choice of specialty.*

Results. *Response rates were 78–94%. Students with mentors and research experience in any specialty were 3.4 times (P < .001) more likely to choose surgery by their third year of medical school. Surgical research experience on the first- and second-year surveys was associated with 39 (P < .001) and 10 times (P < .001) greater odds of preferring surgical specialties on their third-year survey. Medical students who had a surgery mentor during the first and second years were associated with 4 (P = .024) and 13 times (P < .001) greater odds of preferring surgical specialties on their third-year survey.*

Conclusion. *Students who begin surgical research during their first year and develop relationships with surgeon mentors during their second year are significantly more likely to maintain an interest in surgical specialties. (Surgery 2017;161:1683-9.)*

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FOR MEDICAL STUDENTS applying to residency programs, choosing a medical specialty is a complex and critical process. In the majority of applicants, this choice establishes their career trajectory. How do the medical students of today navigate the specialty options available to them, and what factors tend to associate with an interest in a given specialty?

Few studies assessing the factors associated with the choice of a career specialty have been performed in medical students. Of the published studies, cross-sectional designs are the most frequent[1-4] and are predominantly specialty specific.[5-10] Although these studies provide valuable information about the relationship between factors affecting their decision and preference of specialty, these studies have been unable to identify or control for other confounding factors. Furthermore, many of the studies were observational or based rarely on a conceptual or a theoretic framework.[11]

Despite their limitations, many of these studies are prompted by predicted shortages and geographic maldistribution of physicians in the context of decreased medical school graduates entering primary care specialties.[12,13] In an effort to elucidate the factors influencing medical

students to pursue a given specialty, researchers hope to determine which factors that affect this decision can be targeted or modified via intervention. As an example, some studies have concluded that medical schools should recruit students from rural settings, because they are more likely to pursue rural primary care medicine.[5,6] Some investigators advocate for recruiting efforts to include educational programs that speak positively about the opportunities available to primary care physicians.[10]

The majority of available studies report certain factors significantly associated with the career choices of specific specialties, but the published medical literature lacks longitudinal studies. A longitudinal assessment would provide a more nuanced understanding of how medical students develop an interest in a specialty area and how factors affecting this decision and preference of specialty change over time. Furthermore, determining the factors associated more strongly with pursuing a given specialty may elucidate modifiable factors and recruitment opportunities.

We developed a longitudinal, multicohort, survey-based study to collect specialty preference and information concerning factors affecting this decision at fixed intervals throughout medical school. The aim of our study was to allow for an analysis of general trends, as well as tracking individual students. Our goal was to determine the factors having the greatest influence on the specialty preferences of medical students leading up to the national residency match.

METHODS

We obtained approval by our Institutional Review Board prior to conducting this research. Sets of individually identifiable surveys were designed to conduct a longitudinal study of medical students. Surveys were administered during attendance-required orientation sessions at the beginning of first year, second year, and clinical clerkships. The surveys were titled based on year in medical school (M1 = first year, M2 = second year, etc). Information included in the surveys was based on informal discussions with medical students and residents regarding the factors that they felt influenced specialty preference, as well as referencing similar surveys that have been used in the past.[1,2,14] Students involved in the creation of the survey instrument did not participate in the study.

In addition to a list of specialty choices, the surveys included questions regarding demographics, finances, academic history, extracurricular activities, history of physician shadowing/

mentoring, and a personal and lifestyle preferences Likert scale (see appendix for survey instrument [online version only]). The responses on a given student's survey were linked to the responses on that same student's previous and future surveys, allowing for longitudinal analysis.

Prior to analysis, the data derived from the survey were examined for the presence of missing data outliers and coding errors. Descriptive statistics, such as frequency distributions, percentages, means, and standard deviations (SD), were used to describe the basic characteristics of the data set. To facilitate further analysis, the variable of specialty selection was dichotomized to indicate choosing either a surgical or nonsurgical specialty at each survey period. The surgical specialties were general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, otolaryngology, plastic surgery, and urology. Students were allowed to assign multiple preferences of specialty, if desired. Students were dichotomized as "surgical" if one or more of their specialty preferences were surgical.

The χ^2 tests of independence and unadjusted odds ratios (OR) were then computed to evaluate the likelihood of a student choosing a surgical versus nonsurgical specialty. As appropriate, Fisher exact tests were used to account for small cell sizes. Stepwise logistic regression analyses were used to ascertain which demographic, experiential, and preference variables were significantly associated with student preferences in 1 or more surgical specialties on the M3 survey.

Specifically, statistically significant factors were determined by entering the factors into the regression model, iteratively removing the "least significant" factors, and subsequently rerunning the model. Once the statistically significant lifestyle/personal factors were identified, a hierarchical logistic regression was used to assess the individual impact of specific factors on choosing a surgical specialty on the M3 survey. All tests were 2-sided. All data were analyzed using SPSS software (v.23; IBM Corp, Armonk, NY).

RESULTS

The first 3 surveys (M1, M2, and M3) were collected from the 2013 and 2014 matriculants at the University of Iowa Carver College of Medicine. The combined response rates for both cohorts (n = 314) for the M1, M2, and M3 surveys were 78% (n = 245), 86% (n = 270), and 94% (n = 295), respectively. The "M3" survey for the 2014 matriculants was performed in January of the M2 year due to the rollout of the new