Influence of Controllable Lifestyle on Recent Trends in Specialty Choice by US Medical Students

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David Jarjoura, PhD
Gregory W. Rutecki, MD

Many factors influence the career specialty decisions that medical students make. These factors range across a wide spectrum from individual characteristics such as personality to anticipation of specialty-related income. Recently, specialty-related lifestyle has drawn increased attention as US medical students have applied in increasing numbers to radiology and anesthesiology programs and in decreasing numbers to general surgery and family practice programs. Studies have suggested that a so-called controllable lifestyle has become a determinant in students’ specialty selection criteria. In the context of the medical specialties, these studies have defined a controllable lifestyle by the following characteristics: personal time free of practice requirements for leisure, family, and avocational pursuits and control of total weekly hours spent on professional responsibilities. This is related to the amount of time remaining for activities independent of medical practice and is a reflection both of total hours worked and number of nights on call. In their study of 346 medical students from 9 US medical schools, Schwartz et al found that students were most inclined to select specialties that had fewer number of practice work hours per week, allowed adequate time for the pursuit of avocational activities, and seemed to have a decreased number of call nights. These aspects of lifestyle were found to be more influential than more traditional motivators, such as remuneration, prestige, and length of training.

Another study has suggested that lifestyle is a factor in later career changes by physicians in practice. One hundred twenty-three of 723 surveyed physicians changed to other specialties after an initial practice experience. The respondents rated time for avocational pursuits and family activities (both lifestyle issues) as important to their decision. Finally, while the number of unfilled general surgery programs increased from 5 in 1997 to 41 in 2001, the percentage of senior medical students who perceived that general surgeons have “inadequate control over their time” increased from 67% to 92%.

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Studies of the influence of lifestyle on specialty choice, however, have yielded conflicting results. In 1989, Schwartz et al first introduced the term controllable lifestyle, which was initially defined as "control of work hours" and was related to choice of specialty. In contrast, Kassebaum and Szenas analyzed the 1993 Association of American Medical Colleges Medical School Graduation Questionnaire (GQ) in an effort to examine lifestyle attributes and found that for the 1993 GQ respondents overall, . . . lifestyle variables . . . were given relatively low ratings in terms of influence. We sought to determine whether the specialty preferences of US medical seniors have changed significantly in recent years and, if so, to estimate the influence of controllable lifestyle and other characteristics of medical specialties.

METHODS

Specialties for Evaluation

We examined only specialties to which US seniors could apply. Based on data available from the 2000-2002 edition of Physician Socioeconomic Statistics published by the American Medical Association (AMA), the following 16 specialties were identified for study: anesthesiology, dermatology, emergency medicine, family practice, internal medicine, neurology, obstetrics and gynecology, ophthalmology, orthopedic surgery, otolaryngology, pathology, pediatrics, psychiatry, radiology (diagnostic), surgery (general), and urology.

Specialty Preferences of US Senior Medical Students

For each of the selected specialties, the number of US seniors ranking a particular specialty as his/her first choice from 1996 to 2002 was determined. Data were gathered from the National Resident Matching Program (NRMP), the San Francisco Matching Program (SFMatch), and the American Urological Association (AUA) Residency Matching Program publications, from Web sites, or directly through the organization (M. Galbreath, AUA residency match coordinator, unpublished data, September 2002). For the NRMP, a specialty was considered to be a first choice if a student ranked that specialty as his/her first choice. For the SFMatch and the AUA Residency Matching Program, which occur before the NRMP, a specialty was considered a student’s first choice if he/she submitted a rank list for that specialty. The number of US applicants to internal medicine and general surgery reported by the NRMP included applicants to both preliminary (1-year) and categorical positions.

Specialty-Related Characteristics

Based on the work by Schwartz et al, the 16 specialties were classified as having either a controllable or uncontrollable lifestyle. Orthopedic surgery and urology were considered surgical specialties and thus classified as having an uncontrollable lifestyle.

The average income for each selected specialty was determined by averaging the median net income after expenses, but before taxes, by specialty from 1993 to 1998 as reported in the AMA’s Physician Socioeconomic Statistics, 2000-2002 edition. An average for this period was used because additional analysis (not reported) found no significant differences among the income trends across specialties.

The work-hours variable was based on the average number of hours in professional activities per week by specialty obtained for 1998 and 1999 as reported in the AMA’s Physician Socioeconomic Statistics. Finally, the years of graduate medical education (GME) required for the selected specialties were determined by the minimum years of residency required for each specialty.

Statistical Analysis

To determine whether specialty preferences of US medical seniors changed from 1996 to 2002, we analyzed a 2-way contingency table (year X specialty) and computed a standard χ² test of homogeneity of the distribution of choices throughout the years. Log-linear models were developed to determine the explanatory power of the 4 variables (lifestyle, income, work hours, and years of GME required) on the change in specialty preference. For clarity, the income variable for specialties was dichotomized into higher or lower-than-

Table 1. Characteristics of the Selected Specialties

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Lifestyle</th>
<th>Average Income, $ in Thousands</th>
<th>Average Work Hours per Week</th>
<th>Years of Graduate Medical Education Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesiology</td>
<td>Controllable</td>
<td>225</td>
<td>61.0</td>
<td>4</td>
</tr>
<tr>
<td>Dermatology</td>
<td>Controllable</td>
<td>221</td>
<td>45.5</td>
<td>4</td>
</tr>
<tr>
<td>Emergency medicine</td>
<td>Controllable</td>
<td>183</td>
<td>46.0</td>
<td>4</td>
</tr>
<tr>
<td>Family practice</td>
<td>Uncontrollable</td>
<td>132</td>
<td>52.5</td>
<td>3</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>Uncontrollable</td>
<td>158</td>
<td>57.0</td>
<td>3</td>
</tr>
<tr>
<td>Neurology</td>
<td>Controllable</td>
<td>172</td>
<td>55.5</td>
<td>4</td>
</tr>
<tr>
<td>Obstetrics and gynecology</td>
<td>Uncontrollable</td>
<td>224</td>
<td>61.0</td>
<td>4</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>Controllable</td>
<td>225</td>
<td>47.0</td>
<td>4</td>
</tr>
<tr>
<td>Orthopedic surgery</td>
<td>Uncontrollable</td>
<td>323</td>
<td>58.0</td>
<td>5</td>
</tr>
<tr>
<td>Otolaryngology</td>
<td>Controllable</td>
<td>242</td>
<td>53.5</td>
<td>5</td>
</tr>
<tr>
<td>Pathology</td>
<td>Controllable</td>
<td>202</td>
<td>45.5</td>
<td>4</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>Uncontrollable</td>
<td>138</td>
<td>54.0</td>
<td>3</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>Controllable</td>
<td>134</td>
<td>48.0</td>
<td>4</td>
</tr>
<tr>
<td>Radiology (diagnostic)</td>
<td>Controllable</td>
<td>263</td>
<td>58.0</td>
<td>4</td>
</tr>
<tr>
<td>Surgery (general)</td>
<td>Uncontrollable</td>
<td>238</td>
<td>60.0</td>
<td>5</td>
</tr>
<tr>
<td>Urology</td>
<td>Uncontrollable</td>
<td>245</td>
<td>60.5</td>
<td>5</td>
</tr>
<tr>
<td>Average for the above specialties</td>
<td>Not applicable</td>
<td>208</td>
<td>53.9</td>
<td>4</td>
</tr>
</tbody>
</table>
average income. The same was done for work hours. Log-linear models were estimated to include all 4 variables in combination and each alone. The models excluded the year × specialty 90 df interaction effects (effects that model completely the change in choices throughout the years). The degree to which each of the 4 variables could explain the change in preferences was determined by comparing model deviances from the saturated model. 28 Likelihood ratio tests were used for generating P values. Significance (α level) for each test of the 4 specialty characteristic variables was set at .01. Analyses were performed with the SAS Proc GENMOD statistical software program (SAS Institute Inc, Cary, NC).

RESULTS
Change in Specialty Preferences of US Senior Applicants

Table 2 lists the number and percentages of graduating US medical students who selected each specialty as their first (or only) choice from 1996 to 2002. The change in percentages across the years was significant (likelihood ratio $\chi^2 = 2689$, P < .001). For example, from 1996 to 2002, the proportion of US seniors ranking anesthesiology as their first choice demonstrated an increasing trend from 1.2% to 6.4%, whereas the proportion ranking surgery as their first choice showed a decreasing trend from 10.4% to 7.6%.

The Influence of Lifestyle and Other Factors on Specialty Choice

In the log-linear model, controllable lifestyle, as a factor alone, explained 37% of the variability in specialty preference from 1996 to 2002. Figure 1 shows the proportion of graduating students ranking a specialty with a controllable lifestyle as their first choice from 1996 to 2002. The linear in-

Table 2. US Senior Medical Students Ranking Selected Specialties as Their Top Choice*

<table>
<thead>
<tr>
<th>Specialty</th>
<th>1996 (n = 14 972)</th>
<th>1997 (n = 15 112)</th>
<th>1998 (n = 15 174)</th>
<th>1999 (n = 15 160)</th>
<th>2000 (n = 14 966)</th>
<th>2001 (n = 14 936)</th>
<th>2002 (n = 14 827)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesiology</td>
<td>172 (1.1)</td>
<td>243 (1.6)</td>
<td>382 (2.5)</td>
<td>417 (2.8)</td>
<td>546 (3.6)</td>
<td>742 (5.0)</td>
<td>944 (6.4)</td>
</tr>
<tr>
<td>Dermatology</td>
<td>33 (0.2)</td>
<td>244 (1.6)</td>
<td>351 (2.3)</td>
<td>317 (2.1)</td>
<td>348 (2.3)</td>
<td>350 (2.3)</td>
<td>338 (2.3)</td>
</tr>
<tr>
<td>Emergency medicine</td>
<td>1035 (6.9)</td>
<td>915 (6.1)</td>
<td>880 (5.8)</td>
<td>884 (5.8)</td>
<td>988 (6.6)</td>
<td>1030 (6.9)</td>
<td>1064 (7.2)</td>
</tr>
<tr>
<td>Family practice</td>
<td>2415 (16.1)</td>
<td>2437 (16.1)</td>
<td>2223 (14.6)</td>
<td>2039 (13.5)</td>
<td>1829 (12.2)</td>
<td>1526 (10.2)</td>
<td>1404 (9.5)</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>3985 (26.6)</td>
<td>3988 (26.4)</td>
<td>4077 (26.9)</td>
<td>3989 (26.3)</td>
<td>3870 (25.9)</td>
<td>3753 (25.1)</td>
<td>3683 (24.8)</td>
</tr>
<tr>
<td>Neurology</td>
<td>212 (1.4)</td>
<td>248 (1.6)</td>
<td>278 (1.8)</td>
<td>264 (1.7)</td>
<td>352 (2.4)</td>
<td>314 (2.1)</td>
<td>324 (2.2)</td>
</tr>
<tr>
<td>Obstetrics and gynecology</td>
<td>1120 (7.5)</td>
<td>1186 (7.8)</td>
<td>1020 (6.7)</td>
<td>963 (6.4)</td>
<td>889 (5.9)</td>
<td>889 (6.0)</td>
<td>891 (6.0)</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>371 (2.5)</td>
<td>371 (2.5)</td>
<td>375 (2.5)</td>
<td>445 (2.9)</td>
<td>455 (3.0)</td>
<td>457 (3.1)</td>
<td>492 (3.3)</td>
</tr>
<tr>
<td>Orthopedic surgery</td>
<td>596 (4.0)</td>
<td>624 (4.1)</td>
<td>671 (4.4)</td>
<td>671 (4.4)</td>
<td>614 (4.1)</td>
<td>658 (4.4)</td>
<td>683 (4.5)</td>
</tr>
<tr>
<td>Otolaryngology</td>
<td>335 (2.2)</td>
<td>308 (2.0)</td>
<td>301 (2.0)</td>
<td>315 (2.1)</td>
<td>276 (1.8)</td>
<td>280 (1.9)</td>
<td>274 (1.8)</td>
</tr>
<tr>
<td>Pathology</td>
<td>239 (1.6)</td>
<td>142 (0.9)</td>
<td>133 (0.9)</td>
<td>154 (1.0)</td>
<td>127 (0.8)</td>
<td>172 (1.2)</td>
<td>200 (1.3)</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>1681 (11.2)</td>
<td>1739 (11.5)</td>
<td>1904 (12.5)</td>
<td>1884 (12.4)</td>
<td>1747 (11.7)</td>
<td>1785 (12.0)</td>
<td>1652 (11.1)</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>482 (3.2)</td>
<td>522 (3.5)</td>
<td>454 (3.0)</td>
<td>528 (3.5)</td>
<td>519 (3.5)</td>
<td>568 (3.8)</td>
<td>608 (4.1)</td>
</tr>
<tr>
<td>Radiology (diagnostic)</td>
<td>499 (3.3)</td>
<td>463 (3.1)</td>
<td>597 (3.9)</td>
<td>703 (4.6)</td>
<td>867 (5.8)</td>
<td>968 (6.4)</td>
<td>903 (6.1)</td>
</tr>
<tr>
<td>Surgery (general)</td>
<td>1559 (10.4)</td>
<td>1437 (9.5)</td>
<td>1269 (8.4)</td>
<td>1291 (8.5)</td>
<td>1278 (8.5)</td>
<td>1185 (7.9)</td>
<td>1123 (7.6)</td>
</tr>
<tr>
<td>Urology</td>
<td>238 (1.6)</td>
<td>255 (1.7)</td>
<td>259 (1.7)</td>
<td>296 (2.0)</td>
<td>270 (1.8)</td>
<td>264 (1.8)</td>
<td>264 (1.8)</td>
</tr>
</tbody>
</table>

*Percentages may not sum to 100 due to rounding.

Figure 1. Percentage of US Medical Seniors Choosing Specialties With Controllable Lifestyles by Year

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crease in percentages during this period is statistically significant (P < .001). After controlling for income, work hours, and years of training, the percentage of variability accounted for by controllable lifestyle increased from 37% to 55% (P < .001).

Income, work hours, and years of training each explained a statistically significant proportion of the variability in preference, but none approaches the explanatory power of controllable lifestyle. Average income, by itself, explains 9% of the overall variability in specialty preference and, as shown in Figure 1, demonstrates a trend for seniors choosing specialties with above average incomes (P < .001). Work hours (Figure 1) showed a trend in preference toward specialties with higher-than-average work hours (P < .001), but work hours alone only accounted for 2% of the variability in specialty preference. Finally, years of GME required (Figure 2) also demonstrated a statistically significant trend in favor of specialties with a minimum of 4 years of required training (P < .001). However, isolating years of required GME explained only 4% of the variability.

The 4 variables together explained 66% of the variability in specialty preference from 1996 to 2002. To determine each variable’s contribution to the 66% figure required an arbitrary ordering of the inclusion of variables into this model. In the most conservative test of the effect of controllability, we ordered the variables as income, work hours, years of GME required, and finally controllable lifestyle. This resulted in income explaining 9% of the variability, 1% of work hours, and 0.3% of years of GME required. Even after accounting for these sources of variability, controllable lifestyle still accounted for 55% of the variability in temporal trends.

**COMMENT**

The increasing preference of US senior medical students for specialties with a controllable lifestyle has significant implications. Chief among them is an alteration in the distribution of US medical graduates and potentially physicians in general by specialty. Family practice and general surgery residency programs, for example, have experienced significantly lower fill rates during the last 6 years. The proportion of positions in family practice filled by US seniors has decreased from 73% in 1996 to 47% in 2002.17,23 For general surgery, the comparable numbers declined from 89% to 75% during this period.17,23 General surgery programs ultimately filled more than 90% of their positions in 2002, whereas family practice programs filled only 80% of their positions.23

The increasing number of women in medicine,30 the rising level of debt among medical students,31 and the changing reward structure in medicine (eg, as a result of decreasing professional autonomy)32 suggest that lifestyle and income will continue to be important factors in students’ career choices. We have previously suggested that lifestyle may be a critical factor that motivates career changes for physicians already in practice.19,33 In addition, the influence of lifestyle on specialty choice may be representative of a larger societal trend. Individuals aged 24 through 38 years in 2003 reported a desire to devote time to outside work (for avocational pursuits) and thus weigh lifestyle more heavily when choosing jobs.34,35 Other professions, such as business36 and engineering,37 are also grappling with innovations that achieve a balance between work and an outside-work lifestyle undisturbed by professional responsibilities.

Attempts to change lifestyle either during training or after the completion of GME may have the potential to alter the future preferences of US medical seniors. For example, the implementation of the 80-hour work week during residency, as required by the Accreditation Council on Graduate Medical Education, may mitigate differences among lifestyles specific to different specialties, at least during residency. Whether lifestyle during and after residency correlates in any significant way and to exactly what degree is not clear. Other factors, such as the growth of

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**Figure 2. Percentage of US Medical Seniors Choosing Specialties With Income Above the Average Income by Year**

GME indicates graduate medical education.
group practices and the increasing separation of outpatient and inpatient responsibilities (eg, the emergence of hospitalists), may affect the lifestyle of different specialties and allow the practitioner more control over the timing of professional commitments. Future research will be required to gauge the impact that these and other changes will have on the contingencies between lifestyle and specialty choice.

Our study has several limitations. First, the assignment of various specialties to controllable or uncontrollable lifestyle may be open to debate. Specialty-related lifestyles were initially classified as either controllable or uncontrollable based on the determinations of Schwartz et al. Their data were acquired from a questionnaire directed at 346 students from 9 medical schools. Three factors (ie, number of work hours per week in practice, adequate time remaining for avocational pursuits, and perceived number of call nights during practice) clearly were weighted more highly than others that have been more traditional motivators (ie, high remuneration and length of residency program). The most strongly weighted were identified as lifestyle variables. Although there may be a subjective component to the classification of certain specialties (orthopedics is surgical and therefore uncontrollable), the preliminary lifestyle attributes as determined by Schwartz et al. have been validated repeatedly. Large studies have supported lifestyle variables as integral to physician satisfaction while in practice. Community tracking of 12,474 physicians demonstrated that increased work hours are strongly and positively associated with physician practice dissatisfaction. A northern California Kaiser study described the perception of dermatology by graduating medical students as “one of the most attractive careers” owing to its controllable lifestyle.

Even though lifestyle criteria may have a certain degree of subjectivity, it appears that the characteristics of lifestyle that affect medicine have been measured consistently and are known to medical students and practitioners.

Second, it is possible that controllable lifestyle may interact with other variables, such as income, work hours, and the years of GME required for certification. In fact, we found a trend, albeit a small one, for US medical seniors to choose specialties with longer-than-average work weeks, which would be expected to contribute to a less attractive lifestyle. Our variable of controllable lifestyle may thus capture other less tangible and even less easily quantified influences that ultimately affect lifestyle.

Third, the data used to assess specialty preference, income, work hours, and years of training required for board eligibility may have limitations. The data for the matching programs reflect only the preferences of US seniors who used the matching programs to select a residency. For example, in 1996, a significant number of dermatology programs had not yet joined the NRMP. This factor may have resulted in an underestimation of fourth-year medical students’ preferences for dermatology that particular year. This limitation likely contributed to a small overstatement of the association between specialty preference and controllable lifestyle. Other limitations, such as the inclusion of both preliminary and categorical applicants for general surgery and internal medicine in the NRMP data, likely artificially inflated the number of applicants pursuing those fields. Some of the applicants to those fields were actually pursuing other specialties (eg, ophthalmology) that require a preliminary surgery or medicine year.

Fourth, the data on income, work hours, and years of required GME also have limitations. The data on physician income and work hours do not match the exact time frame that was used to determine specialty preference. Because there was little variation across years, however, a single estimate for income and work hours for each specialty was applied. A separate analysis (not reported) confirmed the absence of significant differences in trends in physician income by specialty from 1993 to 1998. The years of GME required reflect the minimum requirement when, in fact, many applicants choose residencies with additional years of training.

Finally, although our study found a strong association between the recent specialty preferences of US medical seniors and controllable lifestyle, this does not establish a causal relationship. Although controllable lifestyle is likely important, clearly other factors are also part of what is a complex career decision-making process that ultimately eventuates in a specific specialty choice. In addition, many other factors may account for a large proportion of the difference in preferences seen between 1996 and 2002. One such possible factor is the trend away from primary care in recent years. This transition may be contributing to the 42% decrease in the number of US seniors applying to family practice residencies during the past 6 years, for example. Other factors intrinsic to the individual, such as personality, age, or sex, or characteristics of the specialty itself, such as the type of problems encountered in practice or the continuing development of new technologies, may be playing a role in the preferences of US medical seniors.

Notwithstanding these limitations, our study found a strong association between controllable lifestyle and the recent preferences of US medical seniors. Over time, this could significantly alter the composition of the physician workforce. More study is needed to investigate the present and future impact of lifestyle issues in career choice.

Author Contributions: Study concept and design: Dorsey, Jarjoura, Rutecki. Acquisition of data: Dorsey. Analysis and interpretation of data: Dorsey, Jarjoura, Rutecki. Drafting of the manuscript: Dorsey, Jarjoura, Rutecki. Critical revision of the manuscript for important intellectual content: Dorsey, Jarjoura, Rutecki. Administrative, technical, or material support: Rutecki. Study supervision: Rutecki.

REFERENCES
CONTROLLABLE LIFESTYLE AND SPECIALTY CHOICE


Have you been able to think out and manage your own life? You have done the greatest task of all.
—Michel Eyquem de Montaigne (1533-1592)