Seeking out the “Good Physician”: A National Survey of U.S. Medical Students and Their Identification of Role Models During Medical Training

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Abstract

Background
Doctor role modeling is essential in the career development of medical students. We explored the various personal and professional contexts in which students are reporting exposure to physician role models, and the association of these contexts with their intentions to enter primary care or care for the underserved.

Methods
We surveyed 960 third-year U.S. medical students from 24 U.S. allopathic medical schools in January 2011. We asked respondents whether or not they had been exposed to role models during medical training and in what contexts students interacted with their role model. We also tested associations with career intentions, educational factors, physician relative status, and demographics.

Results
Adjusted response rate was 61% (564/919). Among the respondents, 548 students (97.3%) responded that they encountered a doctor during their medical training who displays the best characteristics of a good physician. When identifying in what contexts students were reporting interactions with their role model, the categories with highest frequencies were: physician who supervised on wards (69%), assigned preceptor/mentor (57%), preceptor/mentor whom the student sought out (26%), personal or family friend (15%), other (3%). Students who sought out their own role models were more likely than non-exposure students to report intentions for primary care (39.8% exposure vs. 31.9% non-exposure, p=0.05) and to report intentions to practice among the underserved (41.4% exposure vs. 26.9...
non-exposure, p<0.01).

Conclusion
Students who sought out their own physician role model were more likely to have intentions to work in primary care or among the underserved. By intentionally seeking out role models during their medical training, students interested in these fields may feel that they are not routinely encountering such role models over the course of their training, or already express such a high motivation for those fields such that they are intentionally seeking additional support.

Keywords: national survey; medical students; role models; primary care; underserved

Introduction

Doctor role modeling is essential in the career development of medical students (Jochemsen-van der Leeuw et al., 2013; Passi et al., 2013; Yoon et al., 2018). A role model is defined in the medical literature as a "person considered to demonstrate a standard of excellence to be imitated (Jochemsen-van der Leeuw et al., 2013)." As medical education is based heavily on observational learning, role modeling can be a powerful tool to impart and instill professional behavior. Medical educators are paying more attention to formative experiences that role models (positive or negative) are having on their students, and how these role models influence future specialization choices (Yoon et al., 2018). Many of these career choices could include fields such as primary care and underserved practices that face significant workforce shortages (O'Connell et al., 2018).

Despite having an increased awareness of the influence of role models during medical education, few national studies have characterized the type of formative exposures that students are having with role models, particularly those who seem to embody the best characteristics of what it means to be a "good physician." For example, students' conception of role model physicians may be shaped more by personal encounters through their own familial connections growing up (Curlin et al., 2007), rather than actual clinical exposures to role models encountered during their training. Therefore, our study conducted a national study of third-year medical students to characterize the various personal and professional contexts in which students are reporting their exposures to physician role models. We also examined the association of these contexts with their intentions to enter primary care or to care for the underserved.

Methods

The Project on the Good Physician mailed a confidential, self-administered questionnaire to 960 third-year U.S. medical students in January 2011. The study sample was drawn from the American Medical Association Physician Master File (AMA-PMF), which includes nearly all medical students pursuing MD and DO degrees in the US and its territories. We designed a systematic survey sampling plan with probability proportional to size and implicit stratification to acquire a nationally representative individual-level data. With this survey design, we selected 24 U.S. allopathic medical schools, and then randomly sampled 40 students from each school. Further details of our methodology have been described elsewhere (Yoon et al., 2018). The study was approved by the University of Chicago Social Sciences Institutional Review Board.

The outcome of interest was a "yes/no" variable asking respondents whether they were ever exposed to role models during medical training: "Have you encountered a doctor during your medical training who in your judgment displays the best characteristics of a good physician?" If a respondent answered "yes", they were directed to another question that asked in what context this physician interacted with the student respondent: (1) "preceptor/mentor assigned by
school" (2) "preceptor/mentor I sought out" (3) "physician who supervised me on the wards" (3) "personal or family friend" or (5) "Other." Primary explanatory variables were socio-demographics (gender, region, underrepresented minority status, having grown up in a medically underserved setting) and educational factors (undergraduate major, educational debt by graduation, social mission score of medical school).

We used descriptive statistics to summarize student socio-demographics, educational factors, and career intentions by exposure to role models (yes/no). Bivariate analyses were performed with Pearson Chi-squared tests to investigate systematic differences by the context of interaction with the selected physician role model. In order to make nationally representative estimates, case weights were constructed to reflect sources of variance associated with the sample design and to adjust for potential nonresponse bias. Analyses were performed using survey analysis procedures (i.e., probability weight, primary sampling units, and strata) in Stata MP v 14.2.

Results/Analysis

After excluding students who were not third year medical students, adjusted response rate was 61% (564/919). Among those responding to the survey item, 548 students (97.3%) responded that they had encountered a doctor during their medical training who displays the best characteristics of a good physician. Table 1 shows the descriptive statistics of various characteristics of medical students by exposure to physician role model.

Table 1: Characteristics of a national sample of U.S. medical students by exposure to physician role model (2011)

| Encounter a good physician? | P-value |
|-----------------------------|---------|
| (n=564) No (n = 15) | Yes (n = 549) | |
| N (%) | N (%) | |
| Female | 5 (33.9) | 253 (46.3) | 0.41 |
| Region | | 0.51 |
| Northeast | 5 (34.4) | 131 (24.3) | - |
| South | 6 (42.4) | 198 (37.5) | - |
| Midwest | 2 (11.3) | 145 (25.1) | - |
| West | 2 (11.8) | 74 (13.1) | - |
| Underrepresented minority | 2 (15.2) | 74 (14.5) | 0.95 |
| Grown up in a medically underserved setting | 4 (29.1) | 134 (25.1) | 0.77 |
| Science or engineering major in undergraduate | | 0.23 |
| No | 1 (6.7) | 95 (20.3) | |
| Yes | 13 (93.3) | 381 (79.8) | |
| Expected total debt until graduation | | 0.42 |
| $100,000 or less | 6 (38.7) | 160 (29.1) | - |
| $100,001 or above | 9 (61.4) | 385 (70.9) | - |
| Medical school ranking according to social mission score | | 0.12 |
| Ranking: 1-30 | 1 (5.9) | 134 (25.1) | |
| Ranking: 30-64 | 6 (39.5) | 143 (25.0) | |
| Ranking: 65-110 | 3 (17.2) | 143 (25.1) | |
| Ranking: 111-140 | 5 (37.3) | 128 (24.8) | |
| Preference for physician specialty | | 0.05 |
| Primary care | 2 (12.0) | 191 (34.6) | - |
| Specialist | 13 (88.0) | 357 (65.4) | - |
When we examined socio-demographics, we found that students with exposure to physician role models were more likely than those without this exposure to report intentions to enter primary care (P-value = 0.05). When we examined in what contexts these students were reporting interactions with their identified physician role model (Table 2), the categories with the highest frequencies were as follows: (1) Physician who supervised on the wards (n=389; 69%); (2) Assigned preceptor/mentor (n=321; 57%); (3) Preceptor/mentor whom the student sought out (n=145; 26%); (4) Personal or family friend (n=85; 15%); (5) Other (n=16; 3%). Students who sought out their own role models were more likely than non-exposure students to report intentions for primary care (39.8% exposure vs. 31.9% non-exposure, p=0.05) and to report intentions to practice among the underserved (41.4% exposure vs. 26.9% non-exposure, p<0.01).

Those reporting exposure to physician role models identified as those who students considered personal or family friends were less likely than non-exposure students to report growing up in medically underserved settings (15.4% exposure vs. 26.9% non-exposure students, p=0.05), less likely to report high educational debt $>100,000 (58.6% exposure vs. 72.7% non-exposure students, p<0.01), and more likely to report a physician parent or grandparent (52.5% exposure vs. 15.9% non-exposure, p<0.01).

### TABLE 2: Characteristics of a National Sample of U.S. Medical Students Reporting Physician Role Models Who Were Sought Out or Who Were Personal/Family Friend (N=564)

| Preceptor/mentor sought | Personal or family friend |
|--------------------------|---------------------------|
|                          | No (n = 479) | Yes (n = 85) | P-value | No (n = 419) | Yes (n = 145) | P-value |
| Female | N (%) | N (%) | 0.16 | 219 (45.9) | 39 (45.9) | 0.99 |
| Region | 0.99 | <0.01 |
| Northeast | 100 (24.3) | 37 (25.7) | - | 119 (25.3) | 18 (21.5) | - |
| South | 152 (37.7) | 52 (37.2) | - | 174 (37.8) | 30 (36.5) | - |
| Midwest | 111 (25.1) | 36 (23.7) | - | 130 (25.7) | 17 (18.9) | - |
| West | 56 (12.9) | 20 (13.4) | - | 56 (11.3) | 20 (23.1) | - |
| Underrepresented minority | 51 (13.1) | 25 (18.3) | 0.12 | 68 (15.4) | 8 (8.9) | 0.14 |
| Grown up in a medically underserved setting | 104 (25.4) | 34 (24.5) | 0.83 | 125 (26.9) | 13 (15.4) | 0.05 |
| Science or engineering major in undergraduate | 0.24 | 0.13 |
| No | 66 (18.5) | 30 (23.8) | - | 77 (18.5) | 19 (27.8) | - |
| Yes | 300 (81.5) | 95 (76.2) | - | 343 (81.5) | 52 (72.2) | - |
| Expected total debt until graduation | 0.45 | <0.01 |
| $100,000 or less | 127 (30.3) | 40 (27.0) | - | 133 (27.3) | 34 (41.4) | - |
| $100,001 or above | 291 (69.7) | 103 (73.0) | - | 343 (72.7) | 51 (58.6) | - |
| Medical school ranking according to social mission score | 0.59 | 0.89 |
| Ranking: 1-30 | 104 (25.2) | 31 (23.0) | - | 117 (24.9) | 18 (23.1) | - |
| Ranking: 30-64 | 105 (24.0) | 44 (29.1) | - | 124 (25.1) | 25 (26.9) | - |
| Ranking: 65-110 | 105 (24.1) | 41 (27.2) | - | 122 (24.5) | 24 (27.4) | - |
Discussion

Throughout their medical education, students are exposed to a wide variety of role models. This exposure, being an important part of their professional development, can lead to both positive and negative influences on their professional behavior, career choice, and their overall sense of well-being (Cook et al., 2014; Yoon et al., 2018). Recent concerns in medical educational reform are centered around enhancing role modeling exposure in the formation of professional character (Carey, Curlin and Yoon, 2015; Leffel et al., 2015; Yoon et al., 2018). Role models are increasingly recognized as central factors to the process of professional identity formation such that their influence is deemed critical to the process of "moral enculturation, taking the values, attitudes, character, and identity of the chosen profession as one's one (Kenny, Mann and MacLeod, 2003)." Our national study of U.S. medical students found that seven out of ten medical students were encountering the "good physician" while on the wards which is considered to be one of the more formative processes of their medical education.

It is also encouraging to note that nearly all students (97.3%) in our national study are reporting an encounter with an exemplary role model whom they considered to be the "good physician." The medical literature is increasingly providing deeper insights on what it takes to be a good physician role model. Based on a review of 39 studies, one recent systematic literature review classified role modeling into six main themes: 1) the attributes of positive doctor role models; 2) the personality profiles of positive role models; 3) the influence of positive role models on students' career choice; 4) the process of positive role modeling; 5) the influence of negative role modeling; 6) the influence of culture, diversity and gender in the choice of role model (Passi et al., 2013). Taken together, role models have a capacity for conscious role modeling in that these physicians were specifically aware of being role models within the context of patient interaction in the presence of learners (Passi et al., 2013). Clinical rotations are a particularly influential opportunity for role models to impart their fund of clinical knowledge and skills while exemplifying the virtues needed for effective physician-patient relationships such as empathic compassion, practical wisdom, and an unwavering commitment to work for the good of the patient. Positive role models were able to avoid a tendency towards impulsiveness and demonstrated an ability to cope with stressful situations, and tended to have personality profiles that included characteristics such as conscientiousness, achievement striving, competence, and trustworthiness (Passi et al., 2013).

Another systematic literature review identified the attributes of positive and negative role modeling in clinical practice (Jochemsen-van der Leeuw et al., 2013). The study determined that positive attributes of role modeling can be divided into three main categories: (1) patient care qualities; (2) teaching qualities; and (3) personal qualities. Each quality category contains an extensive list of attributes with positive role models. Positive role models with patient care qualities were more likely to be "excellent, experienced clinicians who had empathy for patients and positive interactions with patients, patients' families, and other health care workers" (Jochemsen-van der Leeuw et al., 2013). Positive role models with admirable teaching qualities created a safe learning environment for the
learners while having a sense of commitment to their growth by making learning exciting and by stimulating critical thinking. Positive role models with personal qualities were noted to have patience, self-confidence, honesty, integrity, humility and ability to execute leadership skills. The study concluded that students can observe these qualities carefully and "retain what the trainer is modeling, become motivated, and use the modeled behavior as a guide for the trainee's own actions" (Jochemsen-van der Leeuw et al., 2013).

On the other hand, students should be aware of the educational impact of negative role modeling that stem from the bad effects of derogatory humor, persistence of hierarchy and exclusivity by senior doctors, the existence of gender issues, and senior staff members’ ill critique of departments and institutions (Passi et al., 2013). Furthermore, negative role models are those who were perceived as being uncaring, communicated poorly with patients, uncooperative with health care workers, exhibiting unprofessional attitudes, and were not up-to-date in their respective fields of practice (Jochemsen-van der Leeuw et al., 2013). Unfortunately, the impact of negative role modeling can serve as a hidden curriculum through an insidious array of institutional influences that function at the level of the organization and culture (Hafferty, 1998).

Our study found that students who reported exposure to role models whom they intentionally sought out were more likely than those without this exposure to report intentions to enter primary care or care for the underserved. Though we were not able to obtain further details on these encounters, students may have sought out and discovered these role models over the course of their clinical rotations, through word-of-mouth, or through the personal referrals from other students or physicians. Students with an interest in primary care or working among the underserved may seek role models of a similar interests who are able to reinforce or cultivate their interests in these fields. By intentionally seeking out role models during their medical training, students interested in primary care or working among the underserved may feel that they are not routinely encountering such role models over the course of their training, or already express such a high motivation for those fields such that they are intentionally seeking additional support.

In our study, we also found that students who reported encounters with role model physicians who were personal or family friends were less likely to have come from medically underserved backgrounds or report high educational debt $>100,000, but more likely to report a physician parent or grandparent. This finding may suggest that access to physician role models may be dependent on socio-economic factors as well. Learners tend to prefer role models similar to themselves in terms of cultural background, ethnicity, gender and social class (Wright and Carrese, 2003).

There is an increasing societal need for clinicians who are committed to working in primary care and for underserved populations (O'Connell et al., 2018; Yoon et al., 2018). With the aging of the baby-boomer generation, a worsening primary care shortage will only exacerbate the need for experienced clinicians who can care for complex, chronic medical problems of this patient population. The current challenges related to physician satisfaction, patient access, and reimbursement are becoming more even prevalent in this workforce (Hauer et al., 2008). Role models may be playing a role in motivating medical students to enter into such fields (O'Connell et al., 2018; Yoon et al., 2018).

This study has important limitations. Firstly, this was a cross-sectional study, so we could not assess causation between the various factors. Secondly, nonresponse bias may be affected the results of our study. Lastly, our analyses used data collected in 2011 so these associations would need to be further tested in future surveys to confirm these findings with contemporary trends in medical education.
Conclusion

In conclusion, this national study of U.S. medical students found that the majority of students were encountering a role model whom they considered to be the "good physician" during their clinical rotations. Those students who sought out their own physician role models were more likely to have intentions to go to primary care or to work among the underserved than those who did not report that they sought out a role model. More studies are needed to identify what characteristics of role models influence students to ultimately pursue primary care and to work among the underserved.

Take Home Messages

- Nationally, nearly all U.S. students in our study (97.3%) reported that they encountered a doctor during their medical training who displays the best characteristics of a good physician.
- Students who sought out their own physician role models were more likely to have intentions to go to primary care or to work among the underserved than those who did not report that they sought out a role model.
- Access to physician role models may be dependent on socio-economic factors as well.

Notes On Contributors

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**Appendices**

None.

**Declarations**

*The author has declared that there are no conflicts of interest.*
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Ethics Statement

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