

Curriculum Factors Predicting Family Medicine Specialty Choice: An Exploratory Study Among Rural Medical Scholars

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Abstract

Family medicine is central to medical education strategies that produce rural physicians. In 1996, the Rural Medical Scholars Program was created to produce rural family physicians in Alabama. The literature suggests that curriculum can play a supporting role with special admissions in the production of rural family physicians. This study seeks to determine if curriculum factors were associated with family medicine specialty choice among Rural Medical Scholars. A questionnaire was sent to 112 students who had completed the Rural Medical Scholars Program and had either entered or completed residency. Eighty responded to the survey. Several curriculum factors are associated with choosing family medicine specialty among medical students in the Rural Medical Scholars Program; i.e., positive attitudes toward Family Medicine by clinical faculty in OB/GYN, Pediatrics, Psychiatry, and Neurology, and viewing Family Medicine faculty, Family Medicine residents, and community-based family physician preceptors as stronger than other faculty in terms of being clinicians, teachers, and mentors.

Introduction

An educational research interest of faculty of the University of Alabama School of Medicine-Tuscaloosa (UASOM-T) is to understand why some students choose the specialty of Family Medicine. A regional clinical campus of the University of Alabama School of Medicine, UASOM-T, has several programmatic components to address its mission focus of providing primary care physicians to serve rural Alabama. The third and fourth years of clinical medical sciences include a required two-month rotation in rural Alabama studying Family and Community Medicine. There is an unopposed family medicine residency, an institute for rural health research, and an affiliated Master's Degree program in Rural Community Health. A pipeline program recruits and nurtures rural students from high school and college into these programs and culminates in the Rural Medical Scholars Program (RMSP),¹ which specifically admits rural Alabama students into a five-year MS-MD program in rural community health and medicine. Ten Rural Medical Scholars (RMSs) per year make up one-third of each class at UASOM-T.

Rescinding of interest in primary care has been observed in students entering the regional campus through both usual admissions conducted at the main campus in Birmingham and special admissions to the RMSP conducted at the branch campus. The RMSP admissions committee seeks to discern primary care interest and rural practice intent among students with at least eight years of residence in rural Alabama. Whereas all RMSs must impress the committee with their interest in rural primary care to be selected into the program, unpublished program data indicate that 20-30% end up in non-primary care specialties. Ongoing efforts to study the effectiveness of the RMSP provided opportunity to address the research interest with data.

The study was initiated with a literature review that identified admissions, curriculum, and structural factors influencing students' choices of residency training, especially family medicine.² This review was followed with a survey of RMSs who had completed their five-year course of training and had chosen residencies. The survey study was designed to pilot test a questionnaire for determining the effects of admission, curriculum, and structural factors on student choice of family medicine specialty. The results relative to admission factors influencing RMSs to choose family medicine have been reported elsewhere.³ In this paper, curriculum factors that influenced them to choose family medicine are reported.

Literature Review

Six recent reviews or systemic analyses of rural medical education programs^{4,5,6,7,8,9} comment on the importance of curriculum in the production of primary care physicians for rural practice. There is a consensus that curriculum follows admissions in its impact on rural primary care career choice. However, each of the reviews gave credence to various aspects of curriculum. All six note the importance of rural experience in the curriculum. Family medicine or primary care preceptors were found to be important by three,^{4,5,6} as was a rural focus within the curriculum.^{5,6,8} Family medicine faculty was emphasized by two.⁶ A family medicine focus in the curriculum⁶ and problem-based learning⁵ were each noted by one. Five of the reviews^{4,5,6,8,9} recommended that multiple interventions be bundled to influence students to choose to become rural primary care physicians; special admissions rated highest among those interventions, but curriculum was next. Ranmuthugala⁷ found the support for special admissions to be compelling and assessed special rural curriculum as influential but did not find sufficient outcomes data accompanied by control of potential confounders to fully endorse expenditures on a special rural curriculum.

Further literature review disclosed an emphasis on three aspects of a curriculum to promote rural family medicine: special family medicine focus, clinical family medicine emphasis, and curriculum content.

Special family medicine focus. A special family medicine focus throughout medical school helps attract medical students into family medicine. There is a direct relationship between amount of exposure to family medicine that students experience

and the likelihood of choosing family medicine as a career. Required time in family medicine,^{9,10} a required family medicine clerkship,^{9,11,12} involvement of family physicians throughout medical school,^{13,14} and family medicine mentors throughout all four years of medical school^{9,11,15} support the choice of family medicine. Exposure to ambulatory family medicine¹⁶ and rural family medicine rotations^{10,14,17} also play a part.

Clinical family medicine emphasis. Clinical family medicine exposure attracts medical students to family medicine as a career. Students respond positively to family medicine patient care during the preclinical years.¹⁸ The literature discloses advocates for medical curricula to produce family physicians through clinical rotations in family medicine to "exemplify the personal rewards and health care benefits of the family practice approach to care."¹¹ Medical students respond to the opportunity to interact with patients and family medicine attendings including medical school faculty and community-based physicians.¹¹ To adequately portray the discipline, the curriculum should expose students to the wide diversity of patients, problems, and activities that family physicians deal with each day.^{11,15}

Curriculum content. Curriculum content plays an integral part in effectiveness of the medical school in attracting medical students to family medicine. Family medicine emphasizes care of the entire patient or holism.¹⁵ Curricula that promote family medicine as a career demonstrate enduring relationships with patients, continuity of care, and preventive medicine.¹⁵ Likewise, community-based primary care experiences and rural preceptor exposure are key curriculum components.¹⁷

This literature review provides the basis for testing hypotheses relating medical education curriculum to student choice of family medicine for residency training. It would appear that a special focus on family medicine indicates its priority in the school, a clinical emphasis demonstrates its practicality, and its content appeals to students with generalist interests. This study was conducted to test the utility of a questionnaire to discriminate among targeted students who do and do not make this choice. For this pilot study with a small number of participants, the statistical testing is considered to be hypothesis generating, searching for associations that bear further study in less uniform and larger populations of students.

Methods

The methods for this cross-sectional survey of the 80 Rural Medical Scholars who had progressed beyond medical school are described elsewhere.³ The survey pilot tested a 32-question survey containing 12 questions (with multiple parts) related to medical education curriculum; five of these questions shown in Table 1 appear to discriminate between Rural Medical Scholars who did and did not choose family medicine. Three rounds of mailings were conducted. After the first mailing that generated responses from 40 RMSs, the questionnaire was shortened and Question 2 added, accounting for its fewer responses. This research was approved by the Institutional Review Board of The University of Alabama.

Variables. The dependent variable was choice of a family medicine residency (yes or no). Independent variables related to curriculum were derived from the questions shown in Table 1.

Analyses. Univariate and bivariate statistical methods were used to evaluate the responses to the questionnaires using chi-square, Fisher's exact test, logistic regression, and two independent sample t-tests. P-values of .05 or smaller were considered statistically significant. Odds ratios were calculated for factors reaching this level of significance.

Findings

This study included 64 respondents from the 80 Rural Medical Scholars who graduated from the UASOM-T between the years 2000 and 2008, making an 80% response rate (except for Question 2, which was answered by 24 of 40 RMSs who viewed it). As reported before,³ characteristics of respondents were similar to the surveyed group on race (3.1% vs. 2.5% African Americans), gender (39.1% vs. 31.2% females), and percentage choosing family medicine residency (56.2% vs. 48.9%).

The Table demonstrates the five questions related to medical curriculum that correlated with family medicine residency choice at the .05 level. Question 2 indicates that those who perceived the first two years of medical school to not place primary care at high priority were more likely to choose family medicine. Question 7 shows that during clinical clerkships, students who perceived positive attitudes toward students choosing a family medicine career among clinical faculty in other specialties, such as OB/GYN, Pediatrics, Psychiatry, and Neurology, were more likely to choose family medicine. Question 8 indicates that students who reported being exposed least to Internal Medicine residents during the first three years of medical school were more likely to choose Family Medicine. In Question 10, students who reported having a family medicine experience in a medical school clinic were less likely to choose family medicine. From Question 11, students were more likely to have chosen family medicine if they perceived their family medicine instructors, both faculty and preceptors, to be strong clinicians and mentors, and if they perceived their preceptors and residents to be strong teachers.

Discussion

The literature suggests that curriculum follows admissions among the tools at hand to influence medical students to choose to become rural family physicians. The purposes of this study were: 1) to pilot test the utility of a survey questionnaire to detect student characteristics (e.g., attitudes, opinions, self-described attributes) related to curriculum that distinguishes medical students who choose to train in family medicine vs. other specialties and 2) to generate hypotheses about these characteristics to be tested in subsequent studies. The sample used in this pilot study was comprised of Rural Medical Scholars whose variability was limited by a highly selective common admission process. Still, within this cohesive group, the questionnaire produced item responses that more commonly appear

with RMSs who chose family medicine training. We are encouraged about its potential for use in a more diverse population of medical students.

As a hypothesis-generating study, we must first consider its limitations. The study is cross-sectional, thus the time sequence between characteristic and choice of family medicine training cannot be assumed. For example, perhaps attitudes and perceptions were preselected in the admission process or perhaps the choice of family medicine conditioned the attitudes and perceptions that were reported. The sample restricts applicability of the findings to Rural Medical Scholars only. The uniformity of the selective group of respondents could be expected to limit variability in responses and, thus, the power of the questions to detect differences that might be more easily demonstrated in a more natural grouping of students. The limited number of participants made for unstable statistics in some cases and limited our ability to explore for an association among variables while controlling for others. Hence, bivariate analysis was as far as we could go.

Despite these weaknesses, the questionnaire did provide items whose responses aggregated according to choice of family medicine or not; 13 of 54 items performed at the .05 level of significance. These data provide a reasonable basis to study a larger and more diverse population of students in anticipation of validating the presence of these associations (and finding others) and to consider additional factors that might influence such relationships.

One might consider which of these generated hypotheses should take priority in subsequent study. As demonstrated in the literature review, there is no mystery about the importance of family medicine as the principle feature of a curriculum to prepare rural physicians. Thus, we expected the findings suggesting that RMSs choosing family medicine had positive attitudes and opinions about family medicine faculty, residents, and community practitioners during the clinical years of medical school. A more compelling case for study might be found among the questions that reflect the educational environment and setting. In these data, students selecting family medicine found the basic medical sciences years of medical school to afford primary care and family medicine low priority. They more often noted positive support for their intention to practice family medicine during the clinical years of medical school from non-family medicine faculty, while finding strength in the family medicine departmental faculty, residents, and community physicians as clinicians, mentors, teachers, and role models in comparison to other departments. They reported less exposure to internal medicine residents, lending support for unopposed family medicine residencies. Finally, they were less likely to report having experienced family medicine in a medical school clinic (as opposed to their required experience in a rural preceptor's office).

Consistent with the literature reviewed, these data speak to the positive aspects of conducting medical education to produce rural family physicians in a context where family medicine is high-

Table 1: Questionnaire Items related to Curriculum (*Independent Variables*)

1. Indicate whether or not each phrase describes the medical school you attended during the first two years:			
a.	It has a primary care track	<input type="checkbox"/> Yes	<input type="checkbox"/> No (Primary Care Track 1)
b.	It has a rural medicine track	<input type="checkbox"/> Yes	<input type="checkbox"/> No (Rural Medicine Track 1)
2. How accurately does each phrase describe your medical school environment during the first two years?			
a.	Primary Care has high priority	<input type="checkbox"/> Not at all	<input type="checkbox"/> Moderately <input type="checkbox"/> Highly (Primary Care Priority 1)
b.	Family Medicine has high priority	<input type="checkbox"/> Not at all	<input type="checkbox"/> Moderately <input type="checkbox"/> Highly (Family Medicine Priority1)
c.	Family physicians had visible roles in administration and teaching	<input type="checkbox"/> Not at all	<input type="checkbox"/> Moderately <input type="checkbox"/> Highly (Family Physician Visibility 1)
3. During pre-clinical medical school courses, what were the attitudes of clinical faculty to whom you were exposed toward you or peers choosing Family Medicine as a career?			
a.	Obstetrics-Gynecology faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (OB-GYN Attitudes 1)
b.	Internal Medicine faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (IM Attitudes 1)
c.	Surgery faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (Surgery Attitudes 1)
d.	Pediatric faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (Pediatric Attitudes 1)
e.	Psychiatry faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (Psychiatry Attitudes 1)
f.	Family Medicine faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (FM Attitudes 1)
g.	Neurology faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (Neurology Attitudes 1)
h.	Community Medicine faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (Comm Med Attitudes 1)
4. Indicate whether or not each phrase describes the medical school you attended during the last two years:			
a.	It has a primary care track	<input type="checkbox"/> Yes	<input type="checkbox"/> No (Primary Care Track 2)
b.	It has a rural medicine track	<input type="checkbox"/> Yes	<input type="checkbox"/> No (Rural Medicine Track 2)
5. How accurately does each phrase describe your medical school environment during the last two years?			
a.	Primary care was high priority	<input type="checkbox"/> Not at all	<input type="checkbox"/> Moderately <input type="checkbox"/> Highly (Primary Care Priority 2)
b.	Family Medicine was high priority	<input type="checkbox"/> Not at all	<input type="checkbox"/> Moderately <input type="checkbox"/> Highly (Family Medicine Priority 2)
6. On a continuum of medical education clinical emphasis during the last two years from 100% specialty-subspecialty-based to 100% primary care-based, where would you place your medical education experience:			
	<input type="checkbox"/> 100% specialty	<input type="checkbox"/> 50% specialty	<input type="checkbox"/> 100% primary care <input type="checkbox"/> subspecialty <input type="checkbox"/> 50% primary care
	<input type="checkbox"/> 1	<input type="checkbox"/> 2 <input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 (Primary Care Emphasis)
7. During clinical clerkships at medical school, what were the attitudes of clinical faculty to whom you were exposed toward you or peers choosing Family Medicine as a career?			
a.	Obstetrics-Gynecology faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (OB-GYN Attitudes 2)
b.	Internal Medicine faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (IM Attitudes 2)
c.	Surgery faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (Surgery Attitudes 2)
d.	Pediatric faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (Pediatric Attitudes 2)
e.	Psychiatry faculty	<input type="checkbox"/> Very positive	<input type="checkbox"/> Neutral <input type="checkbox"/> Very negative (Psychiatry Attitudes 2)

- f. Family Medicine faculty
 Very positive Neutral Very negative (*FM Attitudes 2*)
- g. Neurology faculty
 Very positive Neutral Very negative (*Neurology Attitudes 2*)
- h. Community Medicine faculty
 Very positive Neutral Very negative (*Comm Med Attitudes 2*)

8. During the first three years of medical school, to what degree were you exposed to the following residents?

- a. Pediatric residents
 None Moderate Great (*Ped Resident Exposure*)
- b. Internal Medicine residents
 None Moderate Great (*IM Resident Exposure*)
- c. Family Medicine residents
 None Moderate Great (*FM Resident Exposure*)
- d. Surgery residents
 None Moderate Great (*Surg Resident Exposure*)
- e. Orthopedic residents
 None Moderate Great (*Orth Resident Exposure*)
- f. Emergency Medicine residents
 None Moderate Great (*EM Resident Exposure*)
- g. OB/GYN residents
 None Moderate Great (*OB-GYN Resident Exposure*)

9. Indicate how much time you spent in a required or elective Family Medicine course during medical school.

- a. Year 1 None 1-7 days 8-14 15-21 22-28 29-56 57 or more (*Time in FM 1*)
- b. Year 2 None 1-7 days 8-14 15-21 22-28 29-56 57 or more (*Time in FM 2*)
- c. Year 3 None 1-7 days 8-14 15-21 22-28 29-56 57 or more (*Time in FM 3*)
- d. Year 4 None 1-7 days 8-14 15-21 22-28 29-56 57 or more (*Time in FM 4*)

10. Indicate the settings of the Family Medicine experiences you had during medical school (Circle all that apply):

- a. Hospital (*Hospital Setting*)
- b. Medical school clinic (*Med Sch Clinic Setting*)
- c. Urban community doctor's office (*Urban Office Setting*)
- d. Rural community doctor's office (*Rural Office Setting*)
- e. Community health center (*CHC Setting*)
- f. Public health department (*PHD Setting*)

11. In your opinion, how do these aspects of the Family Medicine Department at your medical school compare to the other clinical departments?

- a. FM faculty as clinicians
 Stronger Equal Weaker (*Faculty Clinicians*)
- b. FM faculty as teachers
 Stronger Equal Weaker (*Faculty Teachers*)
- c. FM faculty as mentors
 Stronger Equal Weaker (*Faculty Mentors*)
- d. FM residents as teachers
 Stronger Equal Weaker (*Resident Teachers*)
- e. FM residents as role models
 Stronger Equal Weaker (*Resident Role Models*)
- f. FM community physicians as teachers
 Stronger Equal Weaker (*Community Teachers*)
- g. FM community physicians as mentors
 Stronger Equal Weaker (*Community Mentors*)
- h. FM community physicians as clinicians
 Stronger Equal Weaker (*Community Clinicians*)

12. At the time of medical school graduation, how important was each influence in determining your specialty decision?

- a. Medical school teacher
 Not Moderately Highly (*Teacher Influence*)
- b. Residents
 Not Moderately Highly (*Resident Influence*)
- c. Medical school clerkships
 Not Moderately Highly (*Clerkship Influence*)

Table 2: Curriculum Factors* Associated with Choice of Family Medicine Residency among Rural Medical Scholars

Factor (see Table 1)	Total (N)	FM Choice (%)	P-value	Odds Ratio
2.a. Primary Care Priority 1				
Not at all	16	62.5	0.03	11.6
Moderate+	8	12.5		
2.c. Family Medicine Priority 1				
Not at all	17	58.8	0.08	10.0
Moderate+	7	14.3		
7.a. OB/GYN Attitudes 2				
Positive	45	66.7	0.02	4.0
Neutral/Negative	18	33.3		
7.c. Surgery Attitudes 2				
Positive	31	67.7	0.09	2.4
Neutral/Negative	32	46.9		
7.d. Pediatrics Attitudes 2				
Positive	43	67.4	0.02	3.5
Neutral/Negative	19	36.8		
7.e. Psychiatry Attitudes 2				
Positive	38	73.7	< .01	5.6
Neutral/Negative	24	33.3		
7.f. FM Attitudes 2				
Positive	57	61.4	0.08	8.0
Neutral/Negative	6	16.7		
7.g. Neurology Attitudes 2				
Positive	44	68.2	< .01	4.7
Neutral/Negative	19	31.6		
8.b. IM Resident Exposure				
None	48	68.8	<.01	9.5
Moderate+	16	18.8		
8.e. Orth Resident Exposure				
None	57	61.4	0.08	8.0
Moderate+	6	16.7		
10.b. Med Sch Clinic Setting				
Yes	52	50.0	0.04	5.0
No	12	83.3		
10.f. PHD Setting				
Yes	16	75.0	0.08	3.0
No	48	50.0		
11.a. Faculty Clinicians				
Stronger	15	86.7	<0.01	8.1
Equal/Weaker	47	44.7		
11.b. Faculty Teachers				
Stronger	16	75.0	0.06	3.3
Equal/Weaker	46	47.8		
11.c. Faculty Mentors				
Stronger	31	77.4	<0.01	6.5
Equal/Weaker	32	34.4		

Factor (see Table 1)	Total (N)	FM Choice (%)	P-value	Odds Ratio
11.d. Resident Teachers				
Stronger	19	84.2	<0.01	7.0
Equal/Weaker	44	43.2		
11.e. Resident Role Models				
Stronger	23	69.6	0.09	2.5
Equal/Weaker	40	47.5		
11.f. Community Teachers				
Stronger	22	72.7	0.04	3.3
Equal/Weaker	40	45.0		
11.g. Community Mentors				
Stronger	33	69.7	0.01	3.8
Equal/Weaker	29	37.9		
11.h. Community Clinicians				
Stronger	21	76.2	0.01	4.3
Equal/Weaker	40	42.5		

*We show factors that were associated in these data at P-value < 0.05 and calculated Odds Ratios to show the relative size of the effects. Because of the small numbers in this hypothesis-generating pilot study, we also show factors that demonstrated an associational trend at 0.05 < P < 0.10.

ly valued and effectively demonstrated – among family medicine physicians and residents who are strong in their art, in clinics, and community locales. With these findings, the data also suggest an important influence of associated specialist instructors who reinforce the importance of primary care as a career. At the same time, the Rural Medical Scholars in this study, who followed the training path of family medicine for which they were selected, found that preclinical sciences at the urban health sciences center did not place priority on primary care.

There is a growing literature about the “hidden curriculum” of medical education and its influence on students in terms of developing professional attitudes and making career choices.¹⁸ The values and beliefs of those surrounding students in training impact students. There is a growing movement toward dissemination of medical education into communities whose cultures (and hidden curriculums) are less that of the academic health science center and more that of the native community.¹⁸ Does variation in the contexts and settings of medical education not only influence student outcomes beyond specialty choice but also their comfort to practice in nonurban communities and their perceptions of self-worth in doing so? These are questions that can be approached and are timely as this country seeks to address primary care needs of all citizens, many of whom share a context and culture foreign to medical education. Our next use of this questionnaire will expand beyond RMSs to include their classmates and to test the hypotheses that were suggested. We will also seek to hear and respond to what the participants are telling us about the contexts and settings of medical education relative to their intentions to practice medicine that engages with community need.

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