

Entice With Procedures, Inspire With Primary Care: A Preclerkship Pipeline Course

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Abstract

Background and Objectives: The growing demand for primary care clinicians in the United States continues to outstrip their dwindling supply. Many allopathic medical schools, including Stanford University School of Medicine, are not adequately meeting this shortage. We sought to develop a preclerkship elective to increase the visibility and desirability of primary care at our institution.

Methods: A novel 9-week preclerkship elective titled “Primary Care Defined: Perspectives and Procedures,” was designed as a series of procedural workshops followed by interactive sessions with local primary care clinicians. A total of 36 medical and physician assistant students were enrolled. We administered a questionnaire pre- and postcourse to evaluate the impact of the elective on learner interest and attitudes toward primary care.

Results: Twenty-four enrolled and 10 nonenrolled learners completed the questionnaire both pre- and postcourse. A one-way analysis of covariance controlling for gender, program (medical doctor versus physician assistant), and precourse responses demonstrated that enrollees had a significantly increased interest in primary care compared to nonenrollees after the course ($F_{1,32}=9.22, P=.005$). Enrollees also more positively rated their attitudes toward compensation, scope of practice, and job fulfillment than nonenrollees. Both groups had high levels of agreement on statements concerning patient-physician interactions and the importance of primary care to the health care system.

Conclusion: The design and content of this elective offers a framework for other institutions looking to promote the value of primary care specialties, particularly family medicine. Creating opportunities for experiential learning and early student-faculty engagement may encourage preclerkship learners to consider a career in primary care.

Introduction

Primary care in the United States faces a growing supply-demand mismatch. By 2033, the Association of American Medical Colleges projects a shortage of 21,100 to 55,200 primary care physicians and a fall in the ratio of physicians to physician assistants (PA) from 2:1 to 1:1.¹ It remains to be seen whether the rising supply

of PAs will offset demand for primary care.¹ However, increasing proportions of US MD and PA graduates choose to subspecialize each year.²⁻⁴ US medical institutions are not increasing the number of students committed to primary care careers, with less than 10% of graduates over the past decade entering a family medicine residency.⁵⁻⁶

Stanford University School of Medicine is a private academic medical center with 90 MD and 25 PA students annually. From 2011 to 2020, fewer than 5% of each graduating class on average matched into family medicine residencies. Although more students enter internal medicine (21%) or pediatric (7%) residencies, most subspecialize.⁷ Current efforts to foster primary care interest include a patient-centered elective course, student interest groups, and faculty mentorship for research. Clerkship students spend a month in a family medicine rotation and may opt for primary care electives. Despite these opportunities, the pool of students interested in primary care remains modest.

To cultivate early primary care interest among preclerkship students, we developed a novel seminar titled “Primary Care Defined: Perspectives and Procedures.” The course was split into procedural workshops and interactive sessions highlighting clinician perspectives to promote experiential learning and professional mentorship.^{8,9} While similar educational strategies have been successfully applied to emergency medicine, anesthesiology, and surgical fields, none have been reported for primary care specialties.¹⁰ We hypothesized that early preclinical exposure to hands-on learning and meaningful clinical interactions would improve enrollees’ interest and attitudes toward a career in primary care, as measured by a modified validated Family Medicine Attitudes Questionnaire.

Methods

Course Design

This elective was a weekly, 1-hour, lunchtime seminar for Stanford preclerkship students. Following an introductory session, there were four case-based procedural workshops and four interactive sessions. Procedures included abscess incision and drainage, joint injection, intrauterine device insertion, and shave biopsy. Workshops included a patient case, a live demonstration, and small-group practice with an MD or PA facilitator. The interactive sessions addressed key topics such as work-life fit, salary, and posttraining trajectories through panel discussions or breakout groups with clinicians. Speakers from family medicine, internal medicine, and pediatrics across different practice settings were invited. Full details on our curriculum and workshop supplies can be found in the STFM Resource Library.¹¹

Outcomes Evaluation

To evaluate changes in enrollees’ attitudes toward primary care, we modified the previously-validated 14-item Family Medicine Attitudes Questionnaire, which covers six domains (patient relationships, competence and expertise, lifestyle, research, specialty importance, and shortage).¹² Our final unvalidated survey contained 11 5-point Likert scale items from the original instrument,¹³ with an additional question assessing interest in primary care, scaled from 1 to 7 for greater statistical sensitivity.¹⁴ We administered the survey during the first and last weeks of the academic quarter. A nonenrolled control group was recruited through school mailing lists. No compensation was offered for completing the questionnaire. We programmed the tool using Qualtrics XM software (Provo, UT).

We used one-way analyses of covariance (ANCOVA) to test the null hypothesis that enrollee attitudes toward primary care were equal to those of control participants. We assigned enrollment status as the fixed factor, with gender, program (MD vs PA), and precourse responses as covariates, based on variables with major differences between enrollees and controls. We also performed an ANOVA of change from baseline to confirm our findings

due to concern for unconsidered selection bias.¹⁵ We used SPSS software, version 24.0 (IBM Corp, Armonk, NY) for statistical analysis, and set statistical significance at $P < .05$.

The Stanford University Institutional Review Board determined that this study did not meet the definition of human subjects' research.

Results

Twenty-four enrolled and 10 nonenrolled learners completed the pre- and postcourse surveys. Nine enrollees (38%) were MDs and 15 (62%) were PAs, compared to seven (70%) and three (30%) in the nonenrollee group, respectively. Gender distribution was comparable between enrollees (71% female) and nonenrollees (70% female). Table 1 shows other demographic information. Precourse responses were not significantly different between enrollees and nonenrollees (Table 2).

The one-way ANCOVA assessing postcourse level of interest in a career in primary care (correcting for gender, program, and pre-course ratings as covariates) demonstrated a statistically significant difference ($F_{1,32}=9.22$; $P=.005$) between enrollees (5.50 out of 7; 95% CI, 5.16-5.84) and nonenrollees (4.49; 95% CI, 3.94-5.05). The one-way ANOVA of change from baseline was similarly significant ($F_{1,19}=5.10$; $P=.036$), differing primarily in effect size. Significant differences were found in four of the 11 statements, specifically about income, job complexity, career enjoyment, and procedural involvement (Table 3). Statements regarding patient relationships and the importance of primary care (6, 9, 10, 11) received high levels of agreement from both groups. Differences were noted for statements about research and knowledge depth (5, 7, 8), but were not significant.

Discussion

This novel curriculum received highly positive feedback. Learners favored the small class size, high faculty-to-student ratio, and diversity of skills learned. Constructive feedback included allotting more time for the procedural walk-through and reorganizing stations for smoother workflow. Learners also stressed the value of hearing honest perspectives from clinicians on important topics like income and job fulfillment. We observed high levels of engagement across all sessions, lending credibility to the course design and content.

After the course, enrollees rated their interest in primary care significantly higher than did nonenrollees. They also scored more positively on statements regarding compensation, scope of practice, and job fulfillment. These differences suggest that this elective effectively defined key features of primary care and addressed common misconceptions.¹⁶ Enrollees and nonenrollees had high levels of agreement with statements concerning patient-physician interactions and the value of primary care, suggesting baseline appreciation of this information. Topics such as research opportunities and interactions between generalists and specialists may deserve more emphasis in future iterations.

Limitations

Students likely enrolled in this course based on preexisting interest in primary care. Other selection factors include interest in procedural exposure or elective credit for graduation. Enrollees may have known more about the domains highlighted during the elective or felt obliged to submit higher ratings despite guarantee of anonymity. Additionally, many enrollees were PA students who might differ from medical students in their educational goals. Effects of precourse scores and program type, however, were controlled for in the ANCOVA. We did not control for home town size, which differed between enrollees and nonenrollees. Notably, a higher proportion of controls came from rural backgrounds, which may correlate with a higher interest in primary care specialties.¹⁷

While the original survey was validated as an instrument to assess fourth-year medical students' attitudes toward family medicine and likelihood of matching into the specialty, we administered a modified version to preclinical medical students without revalidation, thus limiting the ability to make definitive conclusions based on the survey results. Long-term outcomes, such as match rates into primary care specialties, could not be evaluated given the recency of this course and its small sample size. We also did not stratify student responses by individual primary care specialty. The predominance of PA enrollees will additionally limit generalizability to other institutions. Future instructors should longitudinally follow a larger sample of past and future students for the analysis of residency match outcomes and possible validation of the modified survey instrument.

Conclusions

Our novel elective offers a framework for other medical schools to generate early positive messaging around the activities and impact of primary care specialties. Coupling experiential learning with meaningful student-faculty engagement may address concerns that deter preclerkship learners from pursuing careers in primary care.

Tables and Figures

Table 1: Survey Respondent Demographics

Characteristic	n (%) or Median (IQR)	
	Enrollees, n=24	Nonenrollees, n=10
Gender		
Female	17 (71)	7 (70)
Male	7 (29)	2 (20)
Other	0 (0)	1 (10)
Program		
Medical student	9 (38)	7 (70)
Physician assistant	15 (62)	3 (30)
Race^a		
White	13 (52)	8 (73)
Black or African American	1 (4)	0 (0)
Asian	9 (36)	2 (18)
American Indian or Alaska Native	1 (4)	1 (9)
Other	1 (4)	0 (0)
Hometown Size		
Small city/suburb	15 (63)	3 (30)
Small town	5 (21)	0 (0)
Large city	3 (13)	2 (20)
Rural	1 (4)	5 (50)
Marital Status		
Single, never married	20 (83)	9 (90)
Married or domestic partnership	3 (13)	1 (10)
Widowed	1 (4)	0 (0)
Anticipated Educational Debt^b	\$135,000 (\$170,000)	\$150,000 (\$97,500)

^a Category totals may not add to the group sizes due to multiselect answers.

^b Debt (eg, loans) upon graduation from current program.

Abbreviations: IQR, interquartile range.

Table 2: Precourse Questionnaire Response Comparison

Survey Item	Mean (SD)		Independent <i>t</i> Test ^c	
	Enrollees (n=24)	Nonenrollees (n=10)	<i>T</i>	<i>P</i> Value
Interest in a career in primary care (1 to 7) ^a	4.92 (1.50)	3.90 (1.79)	1.70	.099
Attitudes toward primary care (1 to 5) ^b				
1 Primary care clinicians enjoy their work	2.67 (1.05)	2.10 (1.05)	1.50	.143
2 Primary care clinicians incorporate procedures as part of their patient care	4.63 (0.50)	4.50 (0.71)	0.59	.559
3 Primary care clinicians' work is complex and interesting	4.00 (0.66)	4.10 (0.74)	-0.39	.700
4 Primary care specialties provide PCCs with enough income to live well	2.50 (0.83)	2.50 (1.08)	0.00	1.000
5 Research-oriented students should probably not consider primary care	3.29 (0.69)	3.70 (1.06)	-1.34	.191
6 Our healthcare system only works well with PCCs playing an integral part	4.46 (0.66)	4.60 (0.52)	-0.61	.549
7 Research to improve health happens very often in primary care settings	3.75 (0.94)	3.90 (0.88)	-0.43	.670
8 Primary care specialties require knowledge that a subspecialist may not	3.71 (0.86)	3.60 (0.84)	0.34	.738
9 It is important to consider each patient in the context of his or her family	4.58 (0.50)	4.50 (0.53)	0.43	.667
10 Knowledge of family interactions is important in treating individual pts.	3.71 (0.69)	4.10 (0.74)	-1.48	.149
11 PCCs provide only a small fraction of all health care delivered in the United States.	3.88 (0.68)	4.10 (0.88)	-0.81	.425

^a Interest in primary care career was evaluated on 1 to 7 scale, with 1 lowest and 7 highest.

^b Agreement with survey items was evaluated on a 1 to 5 scale: strongly disagree, disagree, unsure, agree, and strongly agree, respectively.

^c Equal variances assumed given significance >.05 for all survey items under Levene's Test for Equality of Variances.

Survey items were not presented in the order listed above.

Abbreviations: PCC, primary care clinician.

Table 3: Postcourse Questionnaire Outcomes

Survey Item	Adjusted Mean (SE) [95% CI] ^a		One-way ANCOVA		
	Enrollees (n=24)	Nonenrollees (n=10)	Mean Δ (E – NE)	F Score	P Value ^b
Interest in a career in primary care (1-7) ^c	5.50 (0.17) [5.16-5.84]	4.49 (0.27) [3.94-5.05]	1.01	9.22	.005
Attitudes toward primary care (1-5) ^d					
1 Primary care clinicians enjoy their work	4.69 (0.10) [4.49-4.88]	3.76 (0.15) [3.45-4.07]	0.93	25.20	<.001
2 Primary care clinicians incorporate procedures as part of their patient care	4.72 (0.09) [4.53-4.91]	3.97 (0.15) [3.67-4.28]	0.75	16.80	<.001
3 Primary care clinicians' work is complex and interesting	4.27 (0.12) [4.03-4.51]	3.45 (0.19) [3.06-3.84]	0.82	12.47	.001
4 Primary care specialties provide PCCs with enough income to live well	4.66 (0.12) [4.41-4.91]	3.82 (0.20) [3.42-4.22]	0.84	12.17	.002
5 Research-oriented students should probably not consider primary care	1.96 (0.16) [1.63-2.29]	2.50 (0.26) [1.98-3.03]	-0.54	3.02	.093
6 Our health care system only works well with PCCs playing an integral part	4.86 (0.07) [4.72-4.99]	4.65 (0.10) [4.43-4.86]	0.21	2.80	.105
7 Research to improve health happens very often in primary care settings	4.08 (0.19) [3.70-4.46]	3.52 (0.30) [2.91-4.13]	0.56	2.36	.135
8 Primary care specialties require knowledge that a subspecialist may not	4.32 (0.18) [3.95-4.68]	3.95 (0.28) [3.36-4.53]	0.37	1.15	.345
9 It is important to consider each patient in the context of his or her family	4.75 (0.09) [4.57-4.94]	4.59 (0.15) [4.29-4.89]	0.16	0.85	.365
10 Knowledge of family interactions is important in treating individual pts.	4.68 (0.09) [4.51-4.86]	4.56 (0.14) [4.28-4.85]	0.12	0.48	.495
11 PCCs provide only a small fraction of all health care delivered in the United States.	1.96 (0.19) [1.57-2.36]	1.99 (0.31) [1.35-2.63]	-0.02	<0.01	.951

^a Covariates in the model are evaluated at the following values: gender 0.76 (male 0, female 1), program 0.47 (PA 0, MD 1), and precourse baseline scores (varies).
^b P values are based on the linearly independent pairwise comparisons among the estimated marginal means.

^c Interest in primary care career was evaluated on 1 to 7 scale with 1 lowest and 7 highest.

^d Agreement with survey items was evaluated on a 1 to 5 scale: strongly disagree, disagree, unsure, agree, and strongly agree, respectively.
 Abbreviation: PCC, primary care clinician.

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