Does an AHEC-sponsored Clerkship Experience Strengthen Medical Students' Intent to Provide Care for Medically Underserved Patients?

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Abstract

Background: The mission of Area Health Education Centers (AHECs) is to recruit and educate students to serve as practicing health care professionals in rural, primary care, and medically underserved communities.
Purpose: We sought to determine if participation in an AHEC-sponsored family medicine clerkship experiences during medical school are significantly associated with a self-reported intent to practice primary care in a medically underserved environment upon graduation.
Method: The study was a prospective cohort study comparing third-year family medicine students with the Indiana University School of Medicine who participated in either an AHEC-sponsored family medicine clerkship to those who completed their required family medicine clerkship outside of the AHEC setting. Following the 160-hour clinical clerkship, all students completed a mandatory, electronic survey and were asked to self-report their intent to the following question: "Which of the following statements best describes the impact of the family medicine clerkship on your intention to provide care to underserved patients when you complete residency training?" The question was integrated into a mandatory post-clerkship evaluation form required by the Indiana University School of Medicine, Department of Family Medicine. A Chi square test of independence as well as a multivariate logistic regression analysis was used to determine the independent association of AHEC clerkship participation and reported intent.
Results: A total of 1,138 students completed the survey. There were not significant differences in age, gender, race, and ethnicity between students that completed an AHEC clerkship and those that did not. After adjusting for gender, race, and ethnicity, AHEC participants were significantly more likely to report an intention to practice primary care in a medically underserved setting upon graduation. Female students were found to be 1.2 to 3.4 times as likely to report increased intent compared to male students (95% CI 1.241 to 3.394).
Discussion: Participation in an AHEC-supported clerkship was associated with a significant increase in self-reported intent to practice primary care in a medically underserved setting. Additional research is required to determine if participation and/or reported intent are predictive of practice selection after graduation.

Key words: Area Health Education Centers, medical students, intent to serve, family medicine, underserved

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Introduction

The need for physicians to practice in medically underserved communities (MUC) is not an unfamiliar issue. However, challenges still exist in the identification and implementation of strategies that will address physician shortage areas in those areas of most need.. The concept of where a student trains as a predictor of where they serve is also a group trend to be utilized as a potential way to influence eventual practice (Ferguson, Cashman, Savageau, & Lasser, 2009). Ko et al. (2005) reported that the medical education experience can have a positive impact on the student's intent to practice in a medically underserved community upon graduation. Similarly, Crandall, Davis, Broeseker, and Hilderbrandt (2008) identified that a positive experience with high quality preceptors/mentors and a well-designed educational curriculum can lead to a positive intent for a student to practice in a medically underserved community. The clinical experiences in medically underserved communities facilitated by regional Area Health Education Centers (AHEC) in Indiana is a specific strategy designed to strengthen the intent of third-year medical students to pursue a practice in MUC settings upon graduation. The primary goal for this study is to assess whether third-year medical students participating in AHEC-sponsored family medicine clerkship experiences report an intent to serve medically underserved patients upon graduation in comparison to third-year medicine students in non-AHEC sponsored family medicine clerkship experiences.

Methods

The research is a prospective cohort study evaluating the correlation between the self-reported intent of third-year medical students to provide care for medically underserved patients upon graduation and their participation in an AHEC-supported family medicine clerkship experience. Medically underserved patients can primarily be defined as individuals who face barriers such as low family income, lack of health care insurance, immigration status, racial and ethnic minority status, and elderly status that decreases their access to health care (Silow-Carroll, Alteras, & Stepnick, 2011). For the purposes of this study, a medically underserved patient is an individual seeking health care at facilities such as community hospitals and healthcare clinics in medically underserved areas. We tested the following hypothesis: third-year medical students participating in AHEC-supported family medicine clerkship experiences is associated with a 5% increase in the proportion of students reporting an intent to provide care for medically underserved patients than their fellow students participating in traditional family medicine clerkships.

As part of ongoing longitudinal tracking of AHEC alumni program participants in Indiana, we obtained access to clerkship data from Indiana University School of Medicine, Department of Family Medicine. This clerkship data source allowed the researcher to identify which students participated in required third-year family medicine clerkship programs, if the clerkship program was supported (or sponsored) by AHEC or not, and the students' corresponding response to an evaluation question distributed by the Department of Family Medicine measuring their intent to serve medically underserved patients upon completion of their residency experience.

The inclusion criteria for this study were that the participants must have been enrolled students with the Indiana University School of Medicine and have participated in a family medicine clerkship experience between June of 2012, and April of 2014 and self-reported their intent to serve medically underserved patients upon entering professional practice. The primary outcome of this study is to assess the correlation between participation in an AHEC family medicine clerkship experience and the self-reported intent to professionally practice in a medically underserved community.

At the completion of their 160-hour family medicine clerkship experience, all third-year medical students were asked to participate in a survey as part of their post-clerkship evaluation. Each student completed their post clerkship evaluation using Cardiff TeleForm and submitted to the Indiana University School of Medicine, Department of Family Medicine. Each student was asked the following:

> Which of the following statements best describes the impact of the family medicine clerkship on your intention to provide care to underserved patients when you complete residency training?

- I intended care for underserved patients before this rotation and my experience strengthened my commitment.
- I intended to care for underserved patients before this rotation and my experience had no impact on my plans.
- I intended to care for underserved patients before this rotation and my experience changed my plans so that I no longer plan to care for underserved patients.
- I did not intend to care for underserved patients before this rotation and my experience changed my plans so that I now plan to care for underserved patients.

- I did not intend to care for underserved patients before this rotation and my experience had no impact on my plans.

In an effort to determine the potential relationship between participation in an AHEC-sponsored family medicine clerkship experience and an increased intent to serve in medically underserved patients upon completion of residency, student clerkship data for this study was extracted from the IU School of Medicine Department of Family Medicine clerkship program. The researcher obtained permission and instruction from the clerkship program staff for the purposes of this study.

Clerkship data was collected from the Indiana University School of Medicine and coded in order to determine the correlation with response to intent to serve in a medically underserved community. Past medical students during the study time period were grouped into two categories: whether their required third-year family medicine clerkship program was facilitated through an AHEC-sponsored program and whether the student self-reported intent to provide care to underserved patients upon completion of residency training. Students' self-reported intent to provide care for medically underserved patients will be categorized as either the student reported an increased intent or not. Additional demographic information on each student was identified such as gender, race, ethnicity, and background (whether students are from an urban or rural environment).

We conducted a Chi-square test and a logistic regression analysis to determine the effects of gender, race, and ethnicity to assess the relationship between the type of sponsored clerkship experience and the self-reported intent to serve medically underserved patients using SPSS version 20 with two-sided *P* values less than .05 considered to be statistical significance. This received approval by the institutional review board of Indiana University.

Results

Between November of 2009 and July of 2014, 1,138 third-year family medicine clerkship students completed required 160-hour family medicine clerkship experiences with Indiana University School of Medicine. Approximately, 184 of those students were assigned by the Department of Family Medicine to participate in AHEC-supported clerkship experiences in a medically underserved community.

Third-year family medicine students who participated in a family medicine clerkship experience and answered the question "which of the following statements best describes the impact of the family medicine clerkship on your

intention to provide care to underserved patients when you complete residency training?" were included in this study, resulting in a total sample size of 1,108 students, 179 of which participated in an AHEC-supported clerkship experience.

The gender distribution of students represented in this study is 56.6 % male and 43.4 % female. Approximately 76.0% of the study participants were white in race, 6.0 % black or African American and the remaining were American Indian or Alaska Native (1.1%), Asian (13.3%), Native Hawaiian or other Pacific Islander (0.1 %), and other/more than one race (3.5%). In terms of ethnicity, only 0.5% of the participants self-reported as Hispanic or Latino.

A Chi square test of independence was performed to examine the correlation between participation in an AHEC-sponsored family medicine clerkship experience and the self-reported intent to provide care for medically underserved patients upon graduation. The relationship between self-reported intent and participation in an AHEC-sponsored clerkship experience was statistically significant, X^2 (1, N = 1,108) = 59.640, $p<.01$. Looking specifically at reported intent to provide care for medically underserved patients, 63.7% (n=114) of students in AHEC-supported family medicine clerkship experiences reported an increased intent as compared to 33.1% (n=307) of their fellow students in third-year family medicine clerkship experiences (Table 1).

Table 1

Comparison of clerkship type vs. self-reported intent to provide care for medically underserved

	Increased intent	No change in intent	Total
Standard family medicine clerkship	307 (33.1%)	621 (66.9%)	928
AHEC-sponsored family medicine clerkship	114 (63.7%)	65 (36.3%)	179
Total	686	421	1,107

A logistic regression analysis was conducted to determine the effects of gender, race, and ethnicity on the likelihood that a student would report an increased intent to practice in medically underserved areas. The logistic regression model was statistically significant indicating that the predictors as a set reliably distinguished between students who did and did not report increased intent to serve medically underserved patients upon graduation (chi square = 19.903, P<.05, df = 10).

The model did not indicate a strong relationship between prediction and reported intent (Nagelkerke $R^2 = .02$), and prediction success overall was 63.2% (11.9% to report increase in intent and 94.8% for no change). Gender was the only statistically significant predictor of reported intent (P<.01) and the EXP(B) value indicated that the odds ratio for female students were 1.2 to 3.4 times as likely to report increased intent compared to their male colleagues. A Chi square test of independence was performed to examine the correlation between gender and the self-reported intent to provide care for medically underserved patients upon graduation. The relationship between gender and participation in an AHEC-sponsored clerkship experience was statistically significant, X^2 (1, N = 1,107) = 14.942, $p<.01$. Looking specifically at reported intent to provide care for medically underserved patients, 38.1% (n=169) of female students in AHEC-supported family medicine clerkship experiences reported an increased intent as compared to 35.2% (n=204) of male students in third-year family medicine clerkship experiences.

The responses to the evaluation question (Table 2) identified the breakdown of each response when looking at a standard third-year family medicine clerkship experience as compared to an AHEC sponsored experience. The indication of a positive response (asterisk) was not visible in the question to the students at the time of completion, but below indicates a positive response regarding intent to provide care for medically underserved patients. Researchers found two positive results stemming from analyzing the specific question items. The first is that almost 18% of all students reported a change in intent - meaning that while they entered the clerkship without intent to provide care for medically underserved patients, they exited the program with a positive change in practice intent. The second interesting finding is that while a fairly low percentage of students participating in a standard family medicine clerkship experience reported a change in intent away from providing care for medically underserved patients, not a single student in an AHEC-supported clerkship experience reported that the experience had a negative impact on their pre-existing plans to care for undeserved patients.

Table 2.

Results of the evaluation question: Which of the following statements best describes the impact of the family medicine clerkship on your intention to provide care to underserved patients when you complete residency training?

Provided responses to answering the question	Standard family medicine clerkship	AHEC-sponsored family medicine clerkship	Total
I intended care for underserved patients before this rotation and my experience strengthened my commitment.*	227 (24.5%)	50 (27.9%)	277
I intended to care for underserved patients before this rotation and my experience had no impact on my plans.	200 (21.6%)	36 (20.1%)	236
I intended to care for underserved patients before this rotation and my experience changed my plans so that I no longer plan to care for underserved patients.	17 (1.8%)	0	17
I did not intend to care for underserved patients before this rotation and my experience changed my plans so that I now plan to care for underserved patients.*	166 (17.9%)	32 (17.9%)	198
I did not intend to care for underserved patients before this rotation and my experience had no impact on my plans.	318 (34.3%)	61 (34.1%)	379
Total	928	179	1107

Discussion

The findings of the study suggest that AHEC-supported clerkship experiences increase the intent of a third-year medical student to serve medically underserved patients. The results indicate that Area Health Education Programs may wish to maximize their partnerships with family medical and other primary care specialty clerkship programs in effort to increase the number of medical students interested in pursuing a practice serving medically underserved patients upon graduation. Given that AHECs often work in partnerships with their community to develop clinical training programs that allow medical students to develop the skills and competencies to serve the medically underserved, the positive association between participation in an AHEC-sponsored clerkship experience and the intent to serve medically underserved falls in line with the research by Ferguson et al. (2009) and Ko et al. (2005)that states medical educational experiences can have a positive impact on the intent to practice after graduation. Given that there are many variables that may arise between when a medical student reports their intent to serve medically underserved patients and their eventual practice location, more follow-up research is needed to determine if the students actually end up practicing in medically underserved communities. The Indiana AHEC

program is currently in the process of tracking these students for future analysis on their practice location. Additional research is also needed to identify the characteristics associated with an AHEC-supported family medicine clerkship experience that influences an increased intent to provide care for medically underserved patients.

The mission of the Indiana AHEC Network is to improve health by recruiting, educating and retaining healthcare professionals for underserved communities in Indiana (Indiana University, 2014). One approach in this mission is to provide third-year medical students with the opportunity to serve Indiana's most vulnerable populations in medically underserved communities during their required family medicine clerkship experience. Since 1972, the AHEC programs have focused on developing community-based educational programs in an effort to promote primary healthcare careers and meeting the supply, distribution, quality, and diversity needs of health care in rural, primary care, and medically underserved communities (Seibert, 2005; Weiner, Ricketts, Fraher, Hanny, & Coccodrilli, 2005). This theory falls in line with Ferguson, Cashman, Savageau, and Lasser's (2009) research that indicates training in a medically underserved community, such as a community health center, has a significant association with a student's likelihood of practicing in a health profession shortage area.

It is essential that individuals, especially those from minority backgrounds, in medically underserved communities have access to practicing physicians with whom they share similar race, ethnicity, language, and cultural experiences (U.S. Department of Health and Human Services Health Resources and Services Administration Bureau of Health Professions, 2006). According to Ko et al. (2005), there are several characteristics that can potentially predict whether physicians will practice in medically underserved communities, specifically those from an underrepresented minority race or ethnic background, growing up in a poor economic background, interest in MUC prior to admission to medical school, and incentives such as scholarships or loan repayment programs.

There are several limitations potentially associated with this study. The first is the complex nature of practice selection. Many variables play a role in a student's selection of practice setting, beyond time spent engaged in a 160-hour clerkship experience, which could not be accounted for in this study. Secondly, while we surveyed students' intent to provide care for medically underserved patients; we were unable to directly measure additional obstacles that would prevent such service, even among those with significant interest. For example, students' that select specialty medical practice or academic careers may be unable to practice in a primary undeserved population as a result of these career selections. A third limitation is the sample size of the study. Given the small numbers of

students from minority race/ethnicity and disadvantaged backgrounds, we could not account if those variables would serve as a predictor in their reported intent to serve medically underserved populations. The final potential limitation is that of human error and the self-reporting nature of the data.

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