

Medical student attitudes before and after participation in rural health fairs

David C. Landy,¹ Michael A. Gorin,¹ Julio D. Egusquiza,¹ Jonathan Weiss,¹ Mark T. O'Connell²

¹Student of Medicine, Department of Medical Education, University of Miami Miller School of Medicine, Miami, USA. ²Senior Associate Dean for Educational Development and Bernard Fogel Chair in Medical Education, Department of Medical Education, University of Miami Miller School of Medicine, Miami, USA.

Background: Despite an increased need, residents of rural communities have decreased access to healthcare and often present unique healthcare challenges associated with their rurality. Ensuring medical students receive adequate exposure to these issues is complicated by the urban location of most medical schools. Health fairs (fairs) conducted in rural communities can provide students exposure to rural health; however, it is unknown how participation affects attitudes regarding these issues. **Materials and Methods:** During the 2010-2011 academic year, first-year medical students were surveyed before and after participating in a rural fair regarding the importance of rural health issues, the need for exposure to rural healthcare, their plans to practice in a rural community, and the educational impact of fairs. **Results:** Of the 121 participating students, 77% and 61% completed pre- and post-fair surveys, respectively. Few had lived in a rural area or planned to practice primary care. Participants strongly agreed that the delivery of healthcare in rural areas was important, and that all physicians should receive rural health training (4.8 and 3.7 out of 5, respectively) despite less than half planning to practice in a rural community. After participating in a rural fair, student attitudes were unchanged, although 87% of participants strongly agreed their involvement had contributed to improving patient health and 70% that the fairs provided rural medicine experience. **Conclusions:** Among urban medical school students with varied interests in primary care, there was strong interest in volunteering at rural fairs and appreciation for the importance of rural health. Fairs provided interested students with rural medicine experience that reinforced student attitudes regarding rural health. Further, students felt their participation improved patient health.

Key words: Education, Medical, Undergraduate, Rural health services, Preventive health services

INTRODUCTION

Rural communities throughout the world suffer from geographic isolation, limited socioeconomic resources, and local physician shortages which have led to decreased access to primary healthcare despite increased need.^[1-5] Additionally, residents of rural communities with access to primary care face unique challenges including limited access to specialized diagnostic and treatment centers, inadequate follow-up and emergency care, and difficulty filling prescriptions.^[6-8] These issues can affect the care of rural residents, even by specialists practicing in urban settings, making this relevant to nearly all physicians.^[9-10]

Many of the strategies employed to increase awareness of rural health issues among physicians, in both the United States and abroad, have targeted medical students.^[11] Examples include recruiting applicants from rural communities, providing financial incentives in exchange for rural practice, and the creation of medical schools devoted to rural health.^[12-14] Recent attempts include exposure to rural health through student interest groups, preceptorships, and elective clerkships.^[15-18] It is hoped

that exposure will lead to increased awareness of these issues among all physicians and more practicing in rural areas.

One barrier to providing rural health exposure is the urban location of most medical schools.^[19] We previously described a method of providing such exposure through student-led health fairs (fairs).^[19] Fairs are one day events organized by medical students under the supervision of attending physicians. Fairs provide access to a variety of health services ranging from cardiovascular disease risk factor screening to female examinations with pap smears. Upon arrival, patients meet with a medical student to determine which health services they should receive. After all tests, medical students discuss the results with patients who are provided targeted health education and referral, when indicated, to reduced-cost clinics. However, it is currently unknown how this experience affects medical student attitudes.

To better understand the impact of fairs on medical student attitudes towards rural health issues, we conducted a study with a pretest-posttest design in which first-year medical students volunteering at

Address for correspondence: Mark T. O'Connell, MD. University of Miami Miller School of Medicine, Rosenstiel Medical Science Building, 2167A. E-mail: moconnell@miami.edu

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rural fairs were surveyed before and after participation. We hypothesized that participants would consider rural health issues and education important and that such views would be stronger after fair participation.

METHODS

The University of Miami Miller School of Medicine, an urban medical school, conducts ten comprehensive fairs each year, with four being held in the rural Florida Keys. Mandatory training sessions are held for all participating medical students the week prior to a fair. Briefly, at training sessions, upper-level students provide first-year students training specific to the health services they will be providing at the fair. Additionally, supervision is provided by upper-level students as well as resident and attending physicians to ensure the appropriate provision of medical services and aid in student learning. All first-year students were invited to complete the pre-fair survey at the session prior to their initial participation in a rural fair during the 2010-2011 academic year (Appendix). The post-fair survey was disseminated to all participating first-year students using an internet-based survey (Appendix). Eligible study participants volunteered at a rural fair at least once but no more than twice, due to the logistics of some rural fairs occurring on the same day.

The pre- and post-fair surveys contained eight matched questions using a 5-point Likert-like scale to assess student attitudes regarding the importance of rural health issues and the need for exposure to such issues. Plans to practice in a rural community were also assessed. The pre-fair survey contained five additional questions concerning student characteristics. The post-fair survey contained three additional questions concerning the overall educational and clinical impacts of the fair. Initial versions of the survey instruments were pilot tested among upper-level medical students.

Because not all participants completed both pre- and post-fair surveys, analyses of items measured on the 5-point Likert-like scale were performed using general linear mixed models to compare mean pre- and post-fair responses. These analyses were repeated using only matched pairs to assess the possibility of bias from non-matched responses (Appendix). Results were consistent with the results produced by including all responses which are reported. Plans to practice in a rural community were analyzed using pre- and post-fair frequencies.

This study was approved by the University of Miami Institutional Review Board. Participation was optional and anonymous. Anonymity was needed to ensure students did not feel coerced to participate or respond in a specific manner. To ensure anonymity, we did not collect names on the surveys or written consent which was implied through survey completion. Analyses were performed using SAS, Version 9.2 (Cary, NC). P-values are provided for the comparisons described above with no adjustment made for multiple comparisons.

Results

In total, 121 first-year medical students volunteered at a rural health fair, representing over 80% of the first-year class. Of these students, 113 participated in our study; 93 completed a pre-fair survey (response rate, 77%) and 74 a post-fair survey (response rate, 61%), with 54 completing both surveys (response rate, 45%). Few planned to practice as a primary care provider and most had never lived in a rural area or visited the Florida Keys (Table 1).

Table 1. Characteristics of all 93 students completing a pre-fair survey

Characteristic	N (%)
Plan to practice as a primary care provider	
Yes	18 (20)
No	40 (44)
Undecided	33 (36)
Population of place most commonly lived in	
Less than 100000 people	21 (22)
100000 to 500000 people	30 (46)
Greater than 500000 people	41 (32)
Ever lived in a rural area	
Yes	16 (17)
No	77 (83)
Ever visited the Florida Keys	
Yes	7 (8)
No	86 (92)

Prior to the fair, participants agreed that the Florida Keys was a rural area and that residents of rural communities had different healthcare needs than urban residents (Table 2). Participants strongly agreed that the delivery of healthcare in rural areas was both important and different from that provided in urban settings (4.8 and 4.3, respectively). Participants agreed that all physicians should receive training in rural health and that too few physicians practice in rural areas (3.7 and 3.8, respectively). After the fair, participant attitudes were largely unchanged. There was a moderate increase in mean participant agreement that the Florida Keys should be classified as a rural area (3.2 vs. 3.7, $p < 0.01$), and there was a small decrease in participant agreement that healthcare should be provided in rural areas (4.8 vs. 4.6, $p < 0.01$).

Table 2. Attitudes regarding rural health issues of 113 first year medical students before and after participation in a rural health fair

Statements*	Pre Fair Mean \pm SE**	Post Fair Mean \pm SE**	P
The Florida Keys should be classified as a rural area with rural communities	3.2 \pm 0.1	3.7 \pm 0.1	<0.01
Residents of rural communities have different healthcare needs than urban residents	3.9 \pm 0.1	3.9 \pm 0.1	0.78
The delivery of healthcare within rural areas is different than in urban areas	4.3 \pm 0.1	4.1 \pm 0.1	0.15
Providing healthcare services within rural areas is important	4.8 \pm 0.1	4.6 \pm 0.1	<0.01
All physicians should receive training in caring for rural communities	3.7 \pm 0.1	3.6 \pm 0.1	0.56
Too few physicians are currently practicing in rural communities	3.8 \pm 0.1	3.8 \pm 0.1	0.68
Too few physicians in training will practice in a rural community in the future	3.8 \pm 0.1	3.8 \pm 0.1	0.99
Physicians who practice medicine full time in urban areas will care for rural residents	3.2 \pm 0.1	3.1 \pm 0.1	0.61

* Questions were asked using a Likert-like 1 to 5 scale with 1 weighted as, "Strongly disagree," and 5 weighted as, "Strongly agree".

** Means and SEs (standard errors) were estimated general linear mixed models to account for incomplete matching of pre- and post-fair surveys. Of 113 first year medical students, 93 completed the pre-fair survey and 74 completed the post-fair survey with 54 completing both

Prior to the fair, 6% of participants reported being, "likely," or, "very likely," to practice full-time in a rural area and another 35% reported a similar intent to practice part-time. After the fair, 14% of respondents reported being, "likely," or, "very likely," to practice full-time in a rural area and another 31% reported a similar intent to practice part-time; changes were not statistically significant.

After the fair, 91% of participants strongly agreed that the fair had improved patient health and 87% strongly agreed that their personal involvement had contributed to this. Further, 70% of participants strongly agreed that the fair had provided experience in the practice of rural medicine and another 20% of participants agreed with this statement.

DISCUSSION

Even among students at an urban medical school with varied interests in primary care, there was strong interest in volunteering at rural fairs and appreciation for the importance of rural health issues. Participation appeared to reinforce attitudes regarding rural health, and students strongly agreed that fairs provided rural medicine experience.

Students at other medical schools may have similar strong interests in obtaining rural health exposure, and fairs may be an attractive method for schools to offer such an experience. Fairs are daylong events that can be conducted without interfering with other curricular activities. Though this also means that fairs only offer limited exposure to rural health issues, this brevity may attract a greater number of students and reduce institutional commitments. Further, even a limited exposure may be much greater than what would other

wise be obtained by students training in urban areas. Fairs have the added benefits of providing interested students with organization and leadership experiences as well as older students and residents with teaching experience. Fairs may also help strengthen community relationships.^[20]

While participation appeared mainly to reinforce prior attitudes, two changes were statistically significant. First, a moderately increased awareness of the rurality of the Florida Keys likely reflects that many students had not previously considered the nature of their more extended surroundings. This may be true for students at other schools with fairs serving to increase community health appreciation. Second, the surprising decline in the importance assigned to providing healthcare in rural areas may be a chance finding or be related to fair patients having less acute issues; patients with severe or emergent disease are likely to seek care elsewhere. Regardless of the decline, students still felt the provision on health care in rural areas was important.

These results provide empirical support for the use of rural fairs to provide rural health exposure to students at urban medical schools. This experience promotes the development of clinical skills through direct patient contact, and participants felt strongly that their involvement helped improve patient health. For first-year medical students, this experience is likely among their earliest clinical encounters, so it is encouraging to learn it was rewarding. Hopefully fair participation sparks a continued interest in promoting community health and volunteerism.

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APPENDIX

1. Pre-Fair Survey

1. Do you currently plan to practice medicine as a primary care provider (check one):

- Yes: General Internal Medicine, General Pediatrics, General OB/Gyn, or Family Medicine
 No: Medicine Specialty, Surgery, Dermatology, Ophthalmology, Neurology, etc.
 Undecided

2. Which best describes the total population of the place where you spent the most time before college (circle one):

0-10,000 10,001-100,000 100,001-500,000 500,001-1,000,000 >1,000,000

3. Aside from College, have you ever lived in a community you consider to be rural? YES NO
 4. Have you previously been to the Florida Keys? YES NO
 5. Have you previously been to a health fair in the Florida Keys? YES NO

How strongly do you agree with the statements below (circle one):

6. The Florida Keys should be classified as a rural area with residents living in rural communities?

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

7. Residents of rural communities have different healthcare needs than urban residents?

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

8. The delivery of healthcare within rural areas is different than the delivery healthcare in urban areas?

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

9. Providing healthcare services within rural areas is important?

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

10. All physicians should receive training in caring for rural communities?

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

11. Only physicians who will practice in rural communities should train in caring for these communities?

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

12. Too few physicians are currently practicing in rural communities?

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

13. Too few physicians in training will choose to practice in rural community in the future.

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

14. Physicians who practice medicine *full time* in urban areas will care for rural residents?

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

15. Upon completing your medical training, how likely is it that you will practice *full time* in a rural area(circle one)?

Very Unlikely Not Likely Likely Very Likely

16. Upon completing your medical training, how likely is it that you will practice *part time* in a rural area(circle one)?

Very Unlikely Not Likely Likely Very Likely

2. Post-Fair Survey

How strongly do you agree with the statements below (circle one):

The Florida Keys should be classified as a rural area with residents living in rural communities?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

Residents of rural communities have different healthcare needs than urban residents?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

The delivery of healthcare within rural areas is different than the delivery healthcare in urban areas?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

Providing healthcare services within rural areas is important?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

All physicians should receive training in caring for rural communities?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

Only physicians who will practice in rural communities should train in caring for these communities?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

Too few physicians are currently practicing in rural communities?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

Too few physicians in training will choose to practice in rural community in the future.
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

Physicians who practice medicine *full time* in urban areas will care for rural residents?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

Upon completing your medical training, how likely is it that you will practice *full time* in a rural area(circle one)?
Very Unlikely Not Likely Likely Very Likely

Upon completing your medical training, how likely is it that you will practice *part time* in a rural area(circle one)?
Very Unlikely Not Likely Likely Very Likely

DOCS run Florida Keys health fairs improved the health of the patient seen?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

My participation in DOCS run Florida Keys health fairs improved the health of the patients seen?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

Participation in DOCS run Florida Keys health fairs provided experience in the practice of rural medicine?
(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

3. Analyses including only matched pairs

3. Table: Attitudes regarding rural health issues of 54 first year medical students before and after participation in a rural health fair

Statements*	Pre Fair Mean**	Post Fair Mean**	P
The Florida Keys should be classified as a rural area with rural communities	3.1	3.8	<.01
Residents of rural communities have different healthcare needs than urban residents	3.9	3.9	.96
The delivery of healthcare within rural areas is different than in urban areas	4.2	4.1	.44
Providing healthcare services within rural areas is important	4.8	4.5	.05
All physicians should receive training in caring for rural communities	3.7	3.6	.70
Too few physicians are currently practicing in rural communities	3.7	3.7	.96
Too few physicians in training will practice in a rural community in the future	3.8	3.7	.64
Physicians who practice medicine full time in urban areas will care for rural residents	3.1	3.1	.87

* Questions were asked using a Likert-like 1 to 5 scale with 1 weighted as, "Strongly disagree," and 5 weighted as, "Strongly agree".

** Means were estimated general linear mixed models to account for matching of pre- and post-fair surveys. Because only the 54 first year medical students completing both the pre- and post-fair surveys were included, this analysis simplifies and replicates a paired t-test.

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