RESEARCH

Prospective Student Pharmacist Interest in a Rural Pharmacy Curriculum

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Objective. To determine prospective student pharmacists' interest in a rural pharmacy health curriculum.

Methods. All applicants who were selected to interview for fall 2011 enrollment at the UNC Eshelman School of Pharmacy were invited to participate in a Web-based survey. Questions addressed participants' willingness to participate in a rural health pharmacy curriculum, interest in practicing in a rural area, and beliefs regarding patient access to healthcare in rural areas.

Results. Of the 250 prospective student pharmacists invited to participate, 91% completed the survey instrument. Respondents agreed that populations living in rural areas may have different health needs, and students were generally interested in a rural pharmacy health curriculum.

Conclusions. An online survey of prospective student pharmacists was an effective way to assess their interest in a rural pharmacy program being considered by the study institution. Location of the rural program at a satellite campus and availability of housing were identified as factors that could limit enrollment.

Keywords: Rural health, pharmacy curriculum, underserved, manpower, survey

INTRODUCTION

North Carolina has developed and implemented many progressive pharmacy practice models. Enhancements in the state's practice acts and collaborative practice agreements, including the Clinical Pharmacist Practitioner Act, have led to considerable flexibility and advancements in patient care specific to the pharmacy profession.¹ The Asheville Project, which was initiated by the City of Asheville, NC, to provide health education and clinical oversight for city employees, demonstrated that pharmacist-directed patient care can achieve significant clinical improvements as well as reductions in total healthcare costs and hospitalizations.^{2,3}

Despite the advanced opportunities for healthcare within the state, substantial disparities exist across different populations, notably among residents of rural and urban areas.⁴⁻¹⁰ For the purposes of this study, "rural" was defined as an area with fewer than 10,000 inhabitants.⁴ Twenty-nine of North Carolina's 100 counties are designated as rural, and more than 80% of these are found in the eastern and western regions of the state.⁴ Individuals

living in rural counties have notable health disparities when compared with those in metropolitan counties.⁵ Twenty-seven of North Carolina's counties have a poverty rate greater than 20%, and the majority of these counties are located in the eastern region of the state.⁶ Furthermore, 9 of these rural counties are designated as having persistent poverty (defined as 20% or more residents considered poor according to each of the last 4 censuses).⁷ This extent of poverty likely contributes to a lack of medical coverage, as individuals in rural counties are less likely than those in metropolitan areas to have either health insurance or a personal physician.⁵

Access to providers contributes to the well-being of an individual and a population, a correlation that is particularly noticeable in underserved regions.^{5,8,9} The North Carolina Institute of Medicine concluded in 2007 that without dramatic changes in the delivery of healthcare or substantial increases in the number of physicians, the state is likely to face a severe shortage of physicians as well as other healthcare providers during the next 20 years.⁹ Eleven North Carolina counties are designated as persistent health-professional shortages areas (PHPSA), 10 being found in eastern and western portions of the state.¹⁰ Counties are designated as PHPSA when they fail to meet the minimum primary regions provider-to-population ratio for at least 6 of the previous 7 years.¹⁰

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North Carolina has no overall shortage of pharmacists, yet the distribution of pharmacists is inconsistent across the state.¹¹ In 2010, the UNC Sheps Center reported that heavily populated counties (eg, Durham in central North Carolina) had an average of 24.3 registered pharmacists per 10,000 individuals, whereas less-populated rural counties (eg, Hyde and Camden in northeastern North Carolina) had no active registered pharmacists. Data evaluated from 1979 to 2008 suggest that this disparity has widened over the past 3 decades.¹¹ Non-PHPSA designated counties have seen a slow increase in the number of pharmacists per 10,000 individuals (5.5 to 10.1), whereas PHPSA-designated counties have seen only a nominal increase in number of pharmacists per 10,000 individuals (3.3 to 4.0). Additionally, of all clinical pharmacy practitioners, the most advanced form of pharmacy practitioners available in the state, less than 15% are practicing in rural North Carolina counties.¹²

The shortage of healthcare providers in rural counties has been associated with higher rates of obesity and active smokers compared with those in metropolitan counties, resulting in a higher incidence of heart disease, diabetes, and chronic obstructive pulmonary disease, and a higher all-cause mortality rate in rural counties.⁸ As demonstrated in the Asheville Project, pharmacists possess the clinical knowledge and practical skills to manage medications for various chronic disease states found in primary care.^{1,2} However, the UNC Eshelman School of Pharmacy, like others (eg, University of Illinois College of Pharmacy Rockford), perceives that pharmacists practicing in rural areas will likely require a different knowledge and skills set and, therefore, require different training than those who practice in metropolitan areas.¹³

The UNC Eshelman School of Pharmacy has taken several steps toward eliminating the unequal distribution of pharmacists in the state. In the past decade, 2 branch campuses have been established in Elizabeth City and Asheville in the eastern and western sections of the state, respectively. The dean also convened a Rural Pharmacy Health Initiative Committee to evaluate the feasibility of developing a rural health pharmacy curriculum at these campuses. In its research, the committee found that only a few colleges or schools of pharmacy have created rural pharmacy tracks within their curricula. The committee generated campus and statewide support after seeking feedback from stakeholders such as rural community groups, state health initiatives, and pharmacists practicing in rural areas. With the establishment of interested partners within the university and across the state, the committee moved forward with formulating a plan for

a program with a rural health focus within the school's existing curriculum. The committee envisioned the program as a certificate program that would be offered only at the 2 satellite campuses and would enroll a select group of highly motivated students. The objective of this study was to determine prospective student pharmacist interest in a UNC Rural Health Pharmacy Curriculum.

METHODS

This study was approved by the UNC Institutional Review Board, and study participants were invited by e-mail to provide consent and participate in the study. A survey instrument was designed to address 3 broad areas: prospective student pharmacist "rurality" (the state or quality of being from a rural area), general perceptions of rural health, and interest in a rural health pharmacy curriculum. To improve readability and quality, the survey instrument was reviewed by a student cohort, a faculty cohort, an administrator cohort, and the Odum Institute for Research.¹⁴ The final instrument consisted of 17 items: ten 5-point Likert-based questions, 1 yes/no question, 1 multiple-selection definition question, and 5 demographic questions. Participants were permitted to skip any survey question and proceed to the remainder. SurveyMonkey (Palo Alto, CA) was used to administer the survey instrument, which was separated into 3 electronic pages. There was no time limit for completion of the instrument, and there was no lockout for duplicate survey instrument submissions.

The link to the survey instrument was distributed by the Office of Student Services to all prospective students who had been invited to interview for admission to the UNC Eshelman School of Pharmacy Class of 2015 using contact e-mail addresses provided by the students. The e-mail instructions detailed the nature of the questionnaire, stated that all responses would remain anonymous, explained that participation in the study would have no effect on admission to the program, asked for an abbreviated informed consent, and provided an electronic link to the questionnaire. The cover letter also defined "curriculum" as "the sum of learning experiences offered by a program" and "rural health" as "health issues specific to patients living in rural areas." The term "rural" was not defined in the cover letter or the questionnaire. The survey instrument was available online for 4 weeks from the date of the initial e-mail; no reminder message was sent. Upon termination of the study period, the polling mechanism was closed on the SurveyMonkey Web site. Responses were collected and combined by the online Web service, and the results were downloaded and analyzed for trends. Results were presented to the Rural Health Pharmacy Initiative Committee 2 weeks after closure of the survey.

RESULTS

An invitation to participate in the study and link to the online survey instrument was sent to 250 prospective student pharmacists. Upon termination of the study period, 227 responses had been collected, yielding a response rate of 91%. Respondents were permitted to skip any question, and the percentage of respondents who skipped individual questions ranged from 0 to 2%. A majority of respondents were female (73.4%). Most respondents (79.4%) were between the ages of 21 and 30 years, 11.6% were older than 30 years, and 9% were younger than 21 years.

Responses to questions related to “rurality” are presented in Tables 1 and 2. Fifty-five respondents (24.6%) stated they spent most of their precollege years in a town with fewer than 10,000 people, meeting the study criteria for a rural area.^{4,15} When asked if they considered themselves to be from a rural area, 85 (37.4%) answered “yes.” When asked to define “rural” by checking corresponding boxes next to correct definitions, respondents most frequently chose “a farming area or region” (92%), followed by “open country with fewer than 2500 residents” (89.7%), and “a non-metropolitan area” (37.1%). No respondents selected “a metropolitan area.”

Responses related to perception of rural health needs are presented in Table 2. Approximately 87% of respondents agreed or strongly agreed that patients in rural areas have different health needs than do those in urban areas; 92% disagreed or strongly disagreed that patients from rural areas have the same level of access to healthcare as do patients from urban areas. There was general agreement (93% agree or strongly agree) that pharmacists are appropriate healthcare providers for patients from these areas, but no consensus was reached regarding the appropriateness of current training for pharmacists in treating patients from rural areas. The questionnaire item “UNC

Eshelman School of Pharmacy is an appropriate institution to provide rural health education” received positive responses (87% agreed or strongly agreed).

Responses related to participant interest in a rural health pharmacy curriculum are presented in Table 3. There was no consensus in response to the item regarding interest in practicing in a rural area upon completion of pharmacy education; responses were spread across the 5 options. Respondents agreed (88% agreed or strongly agreed) that practice experiences in rural areas offer different opportunities than those in nonrural areas. Housing availability was generally considered important when choosing practice experiences in rural areas (74% agreed or strongly agreed). Approximately 18% of respondents were either somewhat or extremely willing to attend a satellite campus to participate in a rural health pharmacy curriculum. There was no consensus regarding willingness to participate in a rural health pharmacy curriculum; 96 respondents (43%) indicated they were somewhat or extremely interested with the balance of responses distributed across other response options.

Because the committee considered offering the rural health program only at satellite campuses and gave preference to students who self-identified as rural, responses of these participants were examined separately. Of the 55 rural respondents, 29 chose “somewhat interested” and 5 chose “extremely interested” in completing a rural health program (61.8% for the combined responses). Roughly 65% of rural respondents (15 choosing “somewhat agree” and 21 “strongly agree”) indicated that they had interest in practicing in a rural area upon completion of training. Fourteen (25.4%) were somewhat willing ($n = 12$) or extremely willing ($n = 2$) to attend a satellite campus in order to participate in a rural pharmacy program.

DISCUSSION

The process of obtaining information to develop a program within the school from students interested in attending pharmacy school was relatively easy and generated valuable information for the committee as they examined the creation of a Rural Health Pharmacy Curriculum. The authors report that roughly 3 hours were required to create and revise the questionnaire, pilot-test the instrument with cohorts, and prepare the initial presentation of results. This low time-intensity intervention was simple to initiate and monitor, and it yielded results that were easily integrated into the committee process.

The gender distribution of respondents was close to that of a typical pharmacy class at UNC Eshelman School of Pharmacy, with more female than male respondents. The age range also corresponded with a typical class at the school. The results from the questionnaire regarding

Table 1. Self-Reported “Rurality” of Respondents by Hometown Population (N = 224)^a

Respondent's Estimation of Hometown Population	Respondents, No. (%)
<1,000	4 (1.8)
1,000-2,500	13 (5.8)
2,501-5,000	15 (6.7)
5,001-10,000	23 (10.3)
10,001-25,000	31 (13.8)
25,001-50,000	42 (18.8)
50,001-100,000	30 (13.4)
100,001-500,000	29 (12.9)
>500,000	37 (16.5)

^a Participants could elect to skip any survey item including this one.

Table 2. Perspectives of Pharmacy Students on Rural Health Needs, N = 227^a

Survey Items	Strongly Agree, No. (%)	Somewhat Agree No. (%)	Neither Disagree Nor Agree, No. (%)	Somewhat Disagree, No. (%)	Strongly Disagree No. (%)	N/A No. (%)
Patients in rural areas have different health needs than those in urban areas.	86 (37.9)	109 (48)	14 (6)	16 (7)	1 (0.4)	1 (0.4)
Patients from rural areas have the same level of access to healthcare as those from urban areas.	3 (1.3)	5 (2.2)	9 (4)	101 (44.9)	107 (47.6)	0
Pharmacists are appropriate professionals to provide healthcare to patients in rural areas.	128 (56.9)	82 (36.4)	7 (3.1)	4 (1.8)	0	4 (1.8)
Pharmacists generally receive appropriate training in caring for rural populations.	15 (6.6)	87 (38.3)	83 (36.6)	32 (14.1)	3 (1.3)	7 (3.1)
UNC Eshelman School of Pharmacy, including its eastern and western NC satellite campuses, is an appropriate institution to provide education in rural health.	99 (44.2)	95 (42.4)	16 (7.1)	11 (4.9)	1 (0.4)	2 (0.9)

^a Participants could elect to skip any survey item.

rurality varied. When asked to identify rural areas from a list, respondents frequently selected an answer that did not correlate with the study's definitions of rural (farming area or region). Two additional items queried rurality of the respondent directly. More respondents self-identified as being from a rural area when asked directly than would have qualified based on hometown population. These varied responses may indicate discrepancies in the participant understanding of "rural."

Participant responses pertaining to rural healthcare were beneficial to the committee. General agreement regarding health disparities and pharmacist placement as healthcare providers in rural areas lent credence to the creation of a rural health-focused pharmacy curriculum. Although a majority of respondents expressed confidence in the school's ability to provide rural pharmacy education, only a minority expressed a high level of interest in participating in a satellite campus-based curriculum in

Table 3. Pharmacy Students' Interest in Rural Health Curriculum, N = 227^a

Survey Items	Strongly Agree, No. (%)	Somewhat Agree, No. (%)	Neither Disagree Nor Agree, No. (%)	Somewhat Disagree, No. (%)	Strongly Disagree, No. (%)	N/A, No. (%)
If offered, I would be interested in completing a rural health-focused track in my curriculum.	15 (6.7)	81 (36.2)	36 (16.1)	55 (24.6)	35 (15.6)	2 (0.9)
I would be willing to attend a satellite campus in order to participate in a rural health education-focused program.	12 (5.4)	29 (12.9)	34 (15.2)	63 (28.1)	81 (36.2)	5 (2.2)
Rotations ^b in rural or small communities offer opportunities for students not found in rotations ^b in urban communities.	82 (36.4)	116 (51.6)	14 (6.2)	9 (4)	2 (0.9)	2 (0.9)
Availability of housing would play a major role in my interest in rotations in practice sites within rural or small communities.	113 (50)	55 (24.3)	28 (12.4)	16 (7.1)	7 (3.1)	7 (3.1)
I am interested in practicing in a rural area upon completion of my education.	45 (19.8)	53 (23.3)	56 (24.7)	46 (20.3)	26 (11.5)	1 (0.4)

^a Participants could elect to skip any survey item.

^b Rotations = practice experiences

rural pharmacy and then practicing in a rural area upon graduation. However, because the committee had previously determined that the rural health program would function best if kept small (approximately 10 students per class), the low percentage of highly interested individuals was neither surprising nor considered detrimental to the program's success.

Responses to questions specific to a rural health program were intriguing in that they raised areas of concern not previously addressed by the committee. The availability of housing options near practice experience sites should be taken into account, considering that respondents indicated this would factor into their decision on whether to participate in the program. The lack of willingness to attend a satellite campus to participate in a rural health curriculum suggests that when first launched, this program is not likely to be an added draw to the satellite campuses. The responses to this question were helpful to the committee's discussions regarding promotion of the new rural health program and in setting goals for admissions and recruitment. Additional marketing for the program may be needed to clearly explain the program to potential recruits.

Although the number of respondents with high-level interest in the rural health program was small, it was determined to be sufficient to move forward with a proposal for the rural health pharmacy curriculum at the UNC Eshelman School of Pharmacy. Interest in the program was higher among rural respondents than among all respondents (61.8% vs 43%) and likewise, more rural respondents intend to practice in a rural area upon completion of their education. The Rural Pharmacy Health Initiative Committee believes that further targeted promotion of the rural health education concept to the incoming class will increase interest in the program. Concerns regarding housing and the draw of the satellite campuses were addressed in the committee's proposal.

This survey instrument has some limitations that may affect its findings. Participants may have been able to complete the survey tool more than once, although, based on examination of Internet-provider addresses, this is unlikely. The questionnaire did not ask about general willingness to attend a satellite campus; thus, this number could not be compared with the number of those interested in attending a satellite campus to participate in a rural health pharmacy curriculum. Although the introductory message containing the link to the questionnaire emphasized that participation would be anonymous and would not affect admission into the program, participant misperceptions cannot be eliminated entirely and may have influenced the study outcomes. Finally, the fact that some participants had received admission offers to

the UNC pharmacy school while others were awaiting a decision may have influenced the decision on whether to participate. Given the inconsistency in responses regarding understanding of "rural," lack of a definition for this term also may have impacted the results.

CONCLUSION

Use of an online questionnaire to assess prospective student pharmacist interest in a potential programmatic offering at the UNC Eshelman School of Pharmacy was a simple process that yielded valuable results. The Rural Pharmacy Health Initiative Committee found that incoming student pharmacists had interest in a rural pharmacy track but that the requirement to be located on a satellite campus might limit enrollment. Other institutions considering starting a rural health program or making other changes to the general pharmacy curriculum might find value in exploring student interest by means of a brief survey instrument.

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REFERENCES

1. Kiel PJ, McCord AD. Pharmacist impact on clinical outcomes in a diabetes disease management program via collaborative practice. *Ann Pharmacother*. 2005;39(11):1828-1832.
2. Bunting BA, Cranor CW. The Asheville project: long-term clinical, humanistic, and economic outcomes of a community-based medication therapy management program for asthma. *J Am Pharm Assoc*. 2006;46(2):133-147.
3. Bunting BA, Smith BH, Sutherland SE. The Asheville project: clinical and economic outcomes of a community-based long-term medication therapy management program for hypertension and dyslipidemia. *J Am Pharm Assoc*. 2008;48(1):23-31.
4. Area Resource File, Core Based Statistical Areas (CBSAs) North Carolina, 2005. US Census and Office of Management and Budget. Produced by North Carolina Health Professions Data System. Cecil G. Sheps Center Web site. http://www.shepscenter.unc.edu/research_programs/rural_program/maps/NC_CBSA_Nov05.pdf. Accessed May 30, 2012.
5. Rural Health Snapshot, August 2010. Produced by the North Carolina's Rural Health Research & Policy Analysis. Cecil G. Sheps Center Web site. http://www.shepscenter.unc.edu/research_programs/rural_program/pubs/other/RuralHealthSnapshot2010.pdf. Accessed May 30, 2012.
6. U.S. Census Bureau, 2005-2009 American Community Survey. <http://www.census.gov/acs/www/>. Accessed May 30, 2012.
7. Area Resource File, USDA County Type: Persistent Poverty 2004. Economic Resource Service, US Department of Agriculture. Produced by the North Carolina's Rural Health Research & Policy Analysis. Cecil G. Sheps Center Web site. http://www.shepscenter.unc.edu/rural/maps/persistent_poverty04.pdf. Accessed May 30, 2012.
8. Shi L, Macinko J, Starfield B, et al. The relationship between primary care, income inequality, and mortality in United States, 1980-1995. *J Am Board Fam Pract*. 2003;16(5):412-422.

9. North Carolina Institute of Medicine. *Providers in Demand: North Carolina's Primary Care and Specialty Supply. NCIOM Task Force on Primary Care and Specialty Supply*. Durham, NC. June 2007.
10. Area Resource File, Health Professional Shortage Areas (HPSAs) North Carolina, 2005. Produced by the North Carolina's Rural Health Research & Policy Analysis. Cecil G. Sheps Center Web site. http://www.shepscenter.unc.edu/rural/maps/nc_hpsa05.pdf. Accessed May 30, 2012.
11. Trends in the Supply of Pharmacists in North Carolina, March 2005. Cecil G. Sheps Center for Health Services Research. http://www.shepscenter.unc.edu/hp/publications/NCpharmacists_march2010.pdf. Accessed May 30, 2012.
12. Licensee Search, "Clinical Pharmacist Practitioner." North Carolina Medical Board. <http://www.ncmedboard.org>. Accessed May 30, 2012.
13. The Doctor of Pharmacy Program at Rockford, College of Medicine at Rockford. <http://rockford.medicine.uic.edu>. Accessed May 30, 2012.
14. Survey Methodology, Odum Institute for Research in Social Science. <http://www.irss.unc.edu/odum/contentSubpage.jsp?nodeid=589>. Accessed May 30, 2012.
15. OMB bulletin No. 04-04, Office of management and budget. http://www.whitehouse.gov/sites/default/files/omb/assets/omb/bulletins/b03-04_attach.pdf. Accessed May 30, 2012.