Creating a new rural pharmacy workforce: Development and implementation of the Rural Pharmacy Health Initiative

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Purpose. An innovative certificate program aimed at expanding the rural pharmacy workforce, increasing the number of pharmacists with expertise in rural practice, and improving healthcare outcomes in rural North Carolina is described.

Summary. Predicted shortages of primary care physicians and closures of critical access hospitals are expected to worsen existing health disparities. Experiential education in schools and colleges of pharmacy primarily takes place in academic medical centers and, unlike experiential education in medical schools, rarely emphasizes the provision of patient care in rural U.S. communities, where chronic diseases are prevalent and many residents struggle with poverty and poor access to healthcare. To help address these issues, UNC Eshelman School of Pharmacy developed the 3-year Rural Pharmacy Health Certificate program. The program curriculum includes 4 seminar courses, interprofessional education and interaction with medical students, embedding of each pharmacy student into a specific rural community for the duration of training, longitudinal ambulatory care practice experiences, community engagement initiatives, leadership training, development and implementation of a population health project, and 5 pharmacy practice experiences in rural settings.

Conclusion. The Rural Pharmacy Health Certificate program at UNC Eshelman School of Pharmacy seeks to transform rural pharmacy practice by creating a pipeline of rural pharmacy leaders and teaching a unique skillset that will be beneficial to healthcare systems, communities, and patients.

Keywords: pharmacy education, rural health, social determinants of health, underserved, workforce development

Am J Health-Syst Pharm. 2017; 74:2005-12

Today's pharmacy students are being prepared for innovative practice roles that will allow them to optimize medication use in a variety of settings. However, pharmacy school curricula often overlook the importance of education about rural pharmacy practice. Most pharmacy students are trained in urban settings, including large academic medical centers, and have little exposure to rural health. One in 5 Americans live in rural communities, and demand for primary care physicians is outpacing supply.[1] Because of the shortage of primary care physicians and medical specialists in rural communities, patients may not receive the care they need. Nurse practitioners and physician assistants have been touted as a solution to the nation's primary care crisis.[1] Incorporating pharmacists into team-based care environments is an additional viable solution for the primary care shortage, since pharmacists are well positioned to manage chronic illnesses, promote wellness, and provide comprehensive medication management.[2-6]

Individuals living in small and rural communities face significant

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DOI 10.2146/ajhp160727

challenges. According to the National Rural Health Association, access to healthcare services, including primary care, specialty care, psychiatry services, and hospital care, is often lacking in rural areas.[7] Patients living in rural areas tend to be older, poor, chronically ill, and less educated than those residing in urban areas.[7] Moreover, rates of overdose from prescription opioid misuse are highest in states with large rural populations.[8] Social determinants of health such as housing, transportation, and education play a significant role in the health of rural communities.[9] Pharmacists who practice in small communities must be knowledgeable about multiple populations and practice areas. Healthcare professionals in rural communities are often called on to serve in leadership roles and need to have the ability to foster trusting relationships with patients, other healthcare professionals, and community leaders. Consequently, having a successful career in rural health requires more than clinical knowledge; it also requires the ability to solve complex problems, a deep understanding of community and social issues, and leadership skills. Because of healthcare professional shortages in rural communities, the nursing and medical professions have created unique initiatives to increase the number of graduates who choose to practice in rural areas.[10-16] However, there is little published information about rural health initiatives in pharmacy schools.[17,18]

North Carolina is considered a rural state, and 80% of its 100 counties are rural.[19] North Carolina pharmacists who hold the Clinical Pharmacist Practitioner designation have collaborative practice agreements with physicians to provide comprehensive medication management in team-based environments, but most practice in urban communities. Moreover, representation by seniors in the populations of some North Carolina counties exceeds the national average.[19] In order to address healthcare challenges in rural areas, the University of North Carolina (UNC) Eshelman School of Pharmacy developed its Rural Pharmacy Health Initiative, a program whose twofold goal is to increase the number of pharmacists in rural team-based settings and to improve healthcare outcomes through the development of innovative practice models and research initiatives. The scope of the initiative includes a recruitment pipeline, the Rural Pharmacy Health Certificate program for doctor of pharmacy degree students, interprofessional collaboration with UNC School of Medicine, and outcomes research. This article describes the development and implementation of the certificate program. To our knowledge, the UNC program is the only university-approved certificate program in rural health within a pharmacy school in the nation.

KEY POINTS

- Healthcare outcomes of patients from rural communities are influenced by multiple factors, including access to care, health literacy, social determinants of health, and the burden of chronic disease.
- Few colleges and schools of pharmacy include an emphasis on rural healthcare in the curriculum, which could negatively affect the pipeline of pharmacists for underserved areas.
- UNC Eshelman School of Pharmacy has developed a novel Rural Pharmacy Health Certificate program that includes rural health seminars, population health projects, experiential education in rural communities, service and leadership activities, and interprofessional education.

Today's healthcare environment is complex, and the delivery of care is transitioning away from a fee-for-service model to one that is driven by quality metrics and population health. Health systems are faced with reengineering services in order to improve health outcomes, lower healthcare costs, and improve the patient experience. Primary care practices are shifting toward the patient-centered medical home model, and accountable care organizations are being created to improve the health of populations. Significant challenges complicate achievement of these goals, particularly in rural communities, including predicted shortages of primary care physicians,[1] closure of critical access hospitals,[20] and significant growth of the geriatric population.[1]

A vast body of literature describes how pharmacists improve healthcare outcomes, and it is imperative that practice innovations extend beyond urban institutions into rural practice. The National Governors Association,[2] the Patient-Centered Primary Care Collaborative,[3] and a landmark 2011 report to the U.S. Surgeon General[4] have recognized the value that pharmacists provide through comprehensive medication management and noted the need for payment reform and provider status for pharmacists. A recently published report highlighted community and ambulatory care practices that have successfully integrated comprehensive medication management.[5] Currently there is wide state-to-state variability in collaborative practice agreements authorized by pharmacy practice acts,[21] and ASHP has issued a call to action to increase prescribing authority for pharmacists.[22] The Centers for Medicare and Medicaid Services has encouraged states to expand collaborative practice agreements to allow for pharmacist prescribing.[23] Moreover, current legislation under consideration in the U.S. House of Representatives and Senate seeks to recognize pharmacists as providers under the Social Security Act, which would increase access to clinical pharmacy services in both rural and health professional shortage areas.[24]

Preparation for the certificate program

In 2012, 3% of pharmacy colleges and schools offered programmatic or longitudinal experiences in rural pharmacy health.[18] In a 2011 survey of students applying for admission to UNC Eshelman School of Pharmacy, 42% indicated interest in a rural health–focused track.[25] The lack of emphasis on rural health in colleges and schools of pharmacy, coupled with the strong interest of prospective pharmacy students, strengthened our institution's resolve to create a rural health curriculum.

It was decided that the certificate program would be based on UNC Eshelman School of Pharmacy's Asheville campus due to the rurality of that region. A rural curriculum proposal was developed and vetted by the school's leadership and curriculum committee. The goals of the program are to recruit students from rural communities to a career in pharmacy, prepare graduates for rural practice, create a new rural pharmacy workforce, and ultimately improve the health of rural communities in North Carolina. The curriculum was approved by the UNC Graduate School as a focused area of study designated as a certificate program, and a director of rural health and wellness was selected. Finally, a Rural Pharmacy Health Advisory Board composed of leaders in pharmacy, medicine, and rural health throughout North Carolina was created. Advisory board members meet annually to brainstorm about regional partnerships, advise about curricular content, and develop interprofessional opportunities for learners in rural communities; they also serve as ambassadors for the Rural Pharmacy Health Initiative. The director oversees the certificate program, serves as course coordinator for rural health seminars, maintains communication with the UNC Graduate School, leads community engagement and recruitment efforts, chairs the advisory board, and partners with interprofessional rural health leaders.

The Rural Pharmacy Health Certificate program was launched in 2014, and 2 professional year 1 doctor of pharmacy students were chosen as the inaugural Rural Pharmacy Health Scholars. Currently, 15 students (about 15.5% of all students on the Asheville campus) are enrolled in the certificate program. Students interact with UNC School of Medicine students enrolled in the Kenan Primary Care Medical Scholars Program, a parallel program for medical students focused on increasing the number of physicians who seek rural health careers. Medical students who are admitted into this program complete a 6-week summer internship and a rural medicine curriculum.[26]

Stimulating interest in rural practice

In order to reach talented students in small and rural communities, a "rural pipeline project" was undertaken. According to the Association of American Medical Colleges, students from rural communities might not receive career guidance about becoming a healthcare professional, and pipeline engagement should begin as early as kindergarten and continue through grade 12.[10] Research with medical students indicates that students tend to gravitate toward practicing in communities that are similar to those in which they were raised[10]; consequently, creation of a rural pipeline of potential pharmacy students is a core component of the Rural Pharmacy Health Initiative. Relationships with regional universities and rural high schools in western North Carolina were fostered, and partnerships with existing programs in North Carolina that provide outreach to middle and high school students interested in health careers were developed. For example, the Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) initiative provides opportunities for students in grades 7–12 to spend a day on a college campus to foster interest in higher education. Middle and high schoolers in the program spend a day at the school of pharmacy to learn about the profession and participate in hands-on activities such as compounding and interpreting labels of nonprescription medications. The ExploreRX program provides opportunities for high schoolers and college students to participate in a full-day career exploration event that provides an introduction to the profession of pharmacy. These students engage in interactive workshops centered around a mock patient who transitions from hospital to home in order to learn about the roles of a pharmacist in multiple practice environments. Other opportunities for students from rural areas to learn about the profession include an internship that lets them play the role of a pharmacy student for a week and a "Scouting Out Pharmacy" program through which Girl Scouts can earn merit badges by organizing a first-aid kit. In addition, the director of health and wellness meets regularly with leaders from secondary schools, colleges, and communities to promote the Rural Pharmacy Health Initiative.

Certificate program curriculum

The certificate program consists of 3 years of focused study centered on the complexities of providing care for patients in rural areas. Students learn about rural health challenges, including poverty, poor access to healthcare, low health literacy, and an increased burden of chronic disease, during didactic and experiential education. They complete 4 semesters of rural pharmacy health seminars that are taught using active learning techniques. Seminar topics include health statistics on patients residing in rural areas; social determinants of health; cultural competence, with an emphasis on populations in rural western North Carolina (e.g., Cherokee Indians, veterans, Spanish-speaking patients); geriatrics; Appalachian traditions; and the opioid epidemic. Students learn about how current efforts to transform the delivery of healthcare

affect rural communities and the important role that pharmacists play in the life of their community with regard to leadership, service, and public health. Because of the emphasis on telehealth in rural communities to improve access to care, students are exposed to practice models that incorporate telehealth technology.

Students complete preclass assignments so that class time is used solely for discussion and application. Some examples of preclass assignments include readings from the National Rural Health Association, materials from the ASHP Section Advisory Group on Small and Rural Hospitals' online resource page, book chapters (e.g., *Hillbilly Elegy,* J. D. Vance's memoir of his Appalachian upbringing), TED Talks (TED Conferences, LLC), and articles from the medical literature about health disparities. Rural practice leaders from medicine, pharmacy, and social science are invited facilitators. Interprofessional leadership training provided for medical and pharmacy students includes an examination of relationship-centered leadership and how it applies to rural clinicians, as well as exploration of the ideal interprofessional team in primary care and small hospitals. In rural settings, it is crucial for healthcare professionals to work together to solve healthcare challenges, including poor access to care, and to communicate with one another effectively as patients transition across the continuum of care. The goal of these sessions is to break down barriers between disciplines that often exist and to foster a philosophy of teamwork and communication.

Rural health pharmacy students are assigned an "adopted community" and a rural pharmacy faculty mentor for the entire program. Specific communities are assigned on the basis of where students will complete shadowing requirements and ambulatory care advanced pharmacy practice experiences (APPEs), with communities chosen each year according to rural pharmacy faculty member availability and community needs. Students investigate resources available in their community by visiting restaurants, grocery stores, pharmacies, primary care clinics, health departments, hospitals, places of worship, parks and recreation facilities, and social services organizations. They complete 2 shadowing experiences per semester in their adopted community. This early experience allows the students to quickly apply concepts learned in rural health seminars. As part of their population health project, students complete a needs assessment of their adopted community by reviewing county health status reports and surveying physicians, pharmacists, nurses, and patients in their assigned practice about perceived unmet healthcare needs. Specifically, they review public health priorities that are established at the county and practice levels, such as unintended pregnancy, chronic diseases, and immunization. Typically there are 1 or 2 physicians and 1 or 2 nurses or medical assistants in each rural practice; the students interview each of these healthcare professionals to uncover population health problems in the community. The healthcare professionals identify several patients for the student to interview in order to "capture the patient voice" and gather information and feedback. Over the course of the certificate program, students develop an intervention to improve a previously identified unmet need. The rural pharmacy health faculty member oversees the project and assists the student with proposal development, application for approval by an institutional review board, data collection and interpretation, and writing a project summary. Students complete a research APPE during their fourth year, prior to implementation of their population health project, which provides them with additional instruction and guidance on project management and research design.

Healthcare professionals in rural areas frequently serve as community leaders; therefore, it is important to develop the scholars' passion for servant leadership and civic duty. Scholars complete a minimum of 10 hours of community service per semester through participation in activities such as health fairs and screening events. They also volunteer at a community garden based at a rural clinic, which improves the health of the community by providing fresh vegetables through partnership with a local crisis ministry and food pantry.

Early immersion and APPEs

Students complete 2 distinct 8-week early immersion experiences in rural communities, including small hospitals and independent pharmacies. The first early immersion experience occurs the summer after the first year of pharmacy school, and the second early experience takes place during the second year. This early exposure to pharmacy practice in small towns, partnered with students' shadowing experiences with their rural pharmacy mentor, creates real-life opportunities for students to apply what they are learning in the certificate program in their practice experiences. Fourth-year students complete APPEs in rural settings and return to their assigned primary care practice for a 4-week experience. Overall, students complete 5 of their 11 required pharmacy practice experiences in rural settings.

Resources for launching the initiative

Significant resources were necessary to launch the Rural Pharmacy Health Initiative. Most importantly, support from pharmacy school leadership was critical to the launch and growth of the program. Two faculty at the school had strong interest in rural health and initiated the program prior to the addition of the director of rural health and wellness position. They continue to serve on the Rural Health Advisory Board, assist with teaching, and participate on a research team focused on rural pharmacy practice. In addition to the director, 2 shared faculty members were hired in col-

laboration with Mountain Area Health Education Center (MAHEC); they are based in ambulatory care clinics in small communities. Additional experiential sites in rural communities were developed. A new tenure-track position in rural health outcomes was created to expand the research enterprise, with future expansion of research positions planned. Three postgraduate year 2 ambulatory care pharmacy residency positions were added to support the program. Administrative support is provided by an existing administrative support specialist.

Relationships with key strategic partners have been paramount to the development of the certificate program. UNC School of Medicine created the Kenan Primary Care Medical Scholars Program 1 year before the launch of the certificate program, and faculty in medicine and pharmacy have worked closely together to develop interprofessional opportunities in education and community engagement. MAHEC, Western Carolina University (part of the UNC system), UNC Asheville, and the Mission Health system have served as strong collaborators and advocates for an emphasis on rural health within the region.

Challenges and barriers to implementation

Although the design and implementation of the Certificate in Rural Pharmacy Health program have been successful, challenges and barriers were encountered along the way. Initiating the program in the absence of a full-time director of rural health and wellness created some challenges due to the existing workload of faculty members who developed the program, sought approval from UNC Graduate School, and implemented the curriculum. There was significant discussion about whether the program should begin in the first or second year of pharmacy school. Ultimately, the decision was made to recruit for the program during the first professional year and have the students enter in the second year to allow them to acclimate to the rigors of pharmacy school before beginning the rural health program. Developing the interprofessional components with the Kenan scholars at UNC School of Medicine created challenges due to different curricular requirements and course scheduling. Finally, because few colleges and schools of pharmacy have a rural health curriculum, it was necessary to turn to the literature about rural medicine programs for guidance and best practices.

Measuring program success

Work is underway for assessment of the Rural Pharmacy Health Certificate program. Seminar course evaluations have indicated that students highly value the program as a whole and particularly enjoy the interprofessional components of their education. Students have noted that they would like to delve deeper into cultural competence in rural communities. Over time, the success of the program will be measured by the number of pharmacy school applicants who have an interest in the rural health program and by the number of graduates who enter rural practice. Qualitative assessment of students' experiences in the program will be conducted, and graduate demographics and placement will be tracked for 5 years after students' completion of the program.

Discussion

Low access to healthcare services in rural communities in the United States remains a significant problem. Health disparities exist between Americans who reside in rural communities and those who live in cities and suburbs. The Robert Wood Johnson Foundation's model of social determinants of health emphasizes that health begins in homes, schools, and neighborhoods.[9] According to the *2016 County Health Rankings Key Findings Report* published by the foundation and the University of Wisconsin, individual health status is roughly 20% determined by clinical care, including healthcare access and quality, and about 30% determined by behavioral factors such as tobacco use, alcohol and drug use, and diet and exercise; social and economic factors such as education, employment, income, family and social support, and community safety remain the largest contributor to good health.[19] The report highlighted health disparities based on county rurality. Although premature death rates are improving in urban counties, these rates are worsening in rural counties across the country. Rural counties have higher rates of drug overdose deaths, particularly in northern Appalachia and parts of the West and Southwest.[8,19] Moreover, death from accidents are more likely to occur in rural counties than in urban counties. Rates of smoking, teen pregnancy, and obesity are highest in rural counties.[19] Rural Americans are more likely to live in poverty and less likely to have completed some college education.[19] Americans residing in rural communities have a higher burden of chronic diseases such as hypertension, diabetes, and chronic pain.[8,19] Rural populations comprise a disproportionately high number of seniors.[19]

Retention of healthcare professionals in rural areas is problematic, and the ability to adapt to rural practice and, more importantly, rural life is a key factor in retention of physicians.[11] These worrisome statistics are intensified by the projected shortage of primary care physicians and the closure of rural hospitals.[1,11,20] Because the demographics of rural communities differ from those of urban communities, it is imperative that pharmacists are adequately trained to tackle the unique problems encountered in rural health. Our rural health students explore health disparities, social determinants of health, concepts in geriatric pharmacy practice, and cultural competence in relation to the unique populations they serve. They also contribute to improving the health of served communities through the population health project. Current population health projects center on

interventions for decreasing rates of tobacco use and increasing immunization rates for seniors within their adopted communities.

The literature indicates that there are important considerations for healthcare professionals to consider when choosing to practice in rural communities. A qualitative study of nurses from rural hospitals in the Southeast evaluated what quality care means to rural nurses.[12] Two themes were identified from focus group discussions with 23 staff nurses and 4 chief nursing officers: "patients are what matters most," and "community connectedness is both a help and hindrance." Nurses noted the relationship complexities that arose when they also knew patients personally, as well as the importance of understanding rural culture and the challenges associated with working in a community as a nonnative.[12] Consequently, it is important for pharmacists who plan to practice in rural areas to not just appreciate the statistics of medical problems in small communities but to embrace the culture of the community where they will practice and to reflect on what it is like to live, work, and play in their small community. Students are embedded into their adopted community for 3 years, which allows them to build relationships with patients, pharmacists, nurses, and physicians at a much deeper level than can be achieved during a 1-month experience. Through their involvement in community engagement projects along with rural medical students and their completion of a community investigation project, they develop a deep understanding of the community they serve.

Although initiatives in rural health are newer to pharmacy education, medicine has focused on rural health for many years. The American Academy of Family Physicians published a position paper focused on recruitment and retention of family physicians in rural areas.[11] The paper cited U.S. census data indicating that 1 in 5 Americans live in rural areas; however, only 10% of the nation's physicians practice in rural communities. Physicians are more likely to choose rural practice if they attended a medical school with an emphasis on rural education or were raised in a rural community.[11] Physician retention in rural areas is associated with multiple factors, including the ability to manage a busy practice without specialists and completion of a residency program that included rural training.[11] There are many lessons that the pharmacy profession can learn from the medical profession's leadership in rural health, including the importance of recruitment in rural communities, teaching about rural health in the Pharm.D. degree curriculum, expanding postgraduate residency training in rural communities, and supporting pharmacists who practice in rural settings. It is important for the profession of pharmacy to support the unique educational and networking needs of pharmacists who practice in rural communities. ASHP has taken the lead in supporting rural pharmacists through the Section Advisory Group on Small and Rural Hospitals, which creates opportunities for networking with other pharmacists from rural areas and staying abreast of issues pertinent to rural pharmacy practice.[27]

The UNC certificate program emphasizes the importance of relationships with rural communities and the need to identify and mentor high school and college students from rural areas. A recent systematic review of over 2,700 publications on interventions to recruit and retain primary care physicians examined what factors are most likely to increase the number of physicians who choose rural practice.[13] Recruitment of medical students from rural towns increased the likelihood that they would choose rural practice.[13] Several medical schools have created pipeline programs to recruit rural students into medicine with the goal of returning them to rural communities to practice. University of Missouri School of Medicine created the Rural Track Pipeline Program (RTPP) to increase the number of students from rural communities who enroll in medical school and practice in rural areas after graduation.[14] The RTPP included longitudinal exposure to rural practice, including summer community programs, a 6-month rural clerkship, and rural electives. Evaluation of this program determined that 90% of RTPP graduates practiced in Missouri, and 57% chose rural practice.[14] The Illinois Rural Medicine Education (RMED) program is a longitudinal program that focuses on preparing its graduates for rural family medicine practice.[15] The program begins with a pipeline program that engages high school students in summer camps and shadowing experiences. RMED students must have a desire to practice rural medicine; participate in a 4-year curriculum focused on family practice, rural health, and community-based medicine; and sign a nonbinding pledge to complete the entire program.[15] Of note, this program is interprofessional, and pharmacy students from the University of Illinois participate with the medical students in the interprofessional Rural Pharmacy Education (RPHARM) program.[16] Approximately 85–95% of students enrolled in the RPHARM program were raised in rural communities.[16]

Despite the aforementioned curriculum examples in medicine and nursing, an examination of pharmacy education reveals less emphasis on rural health. Thrasher et al.[18] evaluated rural health coursework offerings at U.S. colleges and schools of pharmacy in 2012. At that time, 5 schools and colleges of pharmacy—just 3% of all accredited pharmacy schools in the nation—offered rural health education that was considered formally integrated into the curriculum. A recent cross-sectional study of 250 pharmacy students in Australia evaluated the impact of rural background and rural experiential education on students' intent to practice in rural communities.[28] Students were surveyed at the 2014 National Australian Pharmacy Student Association annual congress,

and 156 students responded (a 62.4% response rate). Eighty-three percent of students from a rural background and 55% from an urban background indicated that they were likely to complete their experiential education in a rural area and to work in a rural area after graduation. Large percentages of students from both rural and urban areas (92% and 95%, respectively) who completed a rural placement during their education rated the experience as beneficial.[28]

In summary, there is a need to improve pharmacy student exposure to the health disparities that exist in rural communities and to increase the number of pharmacists who practice in rural communities. Although the body of literature about rural pharmacy education is limited, data from Australian research indicated that students from rural areas were more likely than their urban counterparts to choose rural practice, and students from either rural or urban communities rated educational experiences in rural areas as beneficial.[28] University of Illinois at Chicago College of Pharmacy has been successful at recruiting students from rural areas into its interprofessional rural curriculum.[16] It is important for the profession of pharmacy to ensure that a well-trained workforce of rural pharmacists exists and that pharmacists are fully prepared to serve as leaders and clinicians in rural pharmacies, clinics, hospitals, and other practice settings. In addition, evaluations of the outcomes of rural pharmacy health initiatives, including assessments of pipeline program effectiveness, curricular success, and impact on health outcomes in rural areas, must be completed.

Conclusion

The Rural Pharmacy Health Certificate program at UNC Eshelman School of Pharmacy seeks to transform rural pharmacy practice by creating a pipeline of rural pharmacy leaders and teaching a unique skillset that will be beneficial to healthcare systems, communities, and patients.

Acknowledgments

The assistance of Laura Bowers, Pharm.D., in the preparation of the manuscript is acknowledged.

Disclosures

Dr. Scott is Chair-Elect, ASHP Section of Ambulatory Care Practitioners. The authors have declared no other potential conflicts of interest.

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