

Provision of Patient Care Services and Goals for Expansion in Community and Ambulatory Care Pharmacies in Southeastern North Carolina

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Abstract

In February 2022, the North Carolina legislature expanded pharmacist dispensing authority without a prescription. We conducted a cross-sectional interview of currently licensed pharmacy managers of outpatient pharmacies located in five counties in southeastern North Carolina. Pharmacy managers were eligible to participate if their pharmacy was either a community pharmacy, clinic-based pharmacy, or outpatient health system pharmacy. Forty-four of 116 eligible pharmacy managers participated (38% response rate). The most common services offered by pharmacies included medication synchronization services (93.2%), on-site immunizations (90.9%), and refill reminders (88.6%). The least common services offered include INR screens (0%), A1c screens (7%), and 'incident-to' billing services associated with CPT codes: annual wellness visits (0%), chronic care management (0%), transitional care management (0%), and remote patient monitoring (2.4%). The services that pharmacy managers wanted to learn more about through continuing education included: oral/transdermal contraceptives (60.5%), administration of long-acting injectables (LAIs) (36.8%), and dispensing of HIV post-exposure prophylaxis (PEP) (23.7%).

Keywords: Community pharmacy; interview; services; students; underserved

Introduction

Community pharmacies in the United States are traditionally known for medication dispensing; however, the community pharmacy model is currently evolving and expanding. By incorporating patient care and creating partnerships with pharmacy schools, physicians, and other healthcare providers, community pharmacies are playing an increasingly important role in meeting patient health care needs.¹⁻⁴ Although many pharmacies offer services such as chronic disease state management, educational consultations, care coordination, and medication optimization services, recent legislation has further expanded pharmacists' scope of practice.⁵ In states such as Idaho, California, Washington, North Carolina, and others, licensed pharmacists are authorized to dispense certain medications without a prescription (e.g., oral contraceptives following patient assessment), administer long-acting injectable (LAIs) medications (e.g., second generation antipsychotics prescribed by physicians), and administer vaccinations to minors (e.g., COVID-19 vaccinations).^{6,7} Community pharmacists are expanding the scope of their practice setting as well, reaching out beyond the four walls of the pharmacy to conduct immunization clinics and health fairs in churches, physician offices, and workplaces.^{5,8}

The impact of patient care services has been well documented in community pharmacies.⁹ Public health initiatives led by community pharmacies have had a significant positive impact on patient health outcomes (blood pressure control, hemoglobin A1C, cholesterol management, depression severity, and asthma control) as well as reducing health care costs.^{3,10-16} Community pharmacies are also an important resource for immunization services, with the number of annual influenza vaccinations administered at these sites increasing from 3.2 million in 2007 to over 40 million in 2021.^{17,18} The ability of community pharmacies to aid in mass immunization has been further highlighted during the COVID-19 pandemic, as supported by their delivery of tens of millions of COVID-19 vaccines to the public over the past two years.¹⁹ Pharmacy students completing practice experiences have aided vaccine delivery, serving an important role as patient care extenders.²⁰ Students also make an average of seven pharmacological interventions per week.²⁰

Accessibility and convenience are key features of community pharmacies in that 95% of Americans live within a 5 mile radius of a community pharmacy.²¹ Additionally, patients visit their community pharmacies on average 35 times per year, as opposed to visiting their primary care physicians only four times per year.²² This comparison is underscored by the current shortage of primary care physicians, which is expected to worsen with an anticipated shortage of up to 48,000 primary care physicians in the United States by 2034.²³ This shortage disproportionately affects underserved areas, where

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community pharmacies frequently serve as the initial point of patient engagement with the health care system.²⁴

It remains challenging to fully characterize the type of community that would benefit most from the expansion of pharmacy services. However, in North Carolina, there is a significant disparity in health outcomes at the county level that correlates with severity of socioeconomic distress. The NC Department of Commerce has stratified this distress using a three-tiered system that incorporates average unemployment rate, median household income, percentage growth in population, and adjusted property tax base per capita, with Tier 1 counties being the most distressed.²⁵ Consistent with historical trends, many Tier 1 counties in southeastern North Carolina continue to perform poorly in preventable hospitalizations, disability, and health-related quality of life as compared to the state average.²⁶ By increasing the delivery of patient care and using pharmacy students as care extenders, community pharmacies in North Carolina have an opportunity to bridge this gap in health outcomes in underserved areas.⁹

In February 2022, North Carolina pharmacists were newly authorized to dispense nicotine replacement therapy, hormonal contraception, prenatal vitamins, HIV post-exposure prophylaxis (PEP), and glucagon, all without the need for a prescription.⁶ Currently, it is unknown to what extent community pharmacies in North Carolina have utilized or will utilize this authorization by adopting these and other advanced services into their business models.²⁷ The purpose of this study is to identify: (a) the current patient care services offered and (b) the pharmacist-selected priorities for future service provision among community and ambulatory pharmacies located in five counties in southeastern North Carolina.

Materials and Methods

The study received exemption status from the Institutional Review Board at the University of North Carolina at Chapel Hill. To evaluate the state of community pharmacy practice in the southeast region of North Carolina, outpatient pharmacy managers in Brunswick, Columbus, Duplin, New Hanover, and Pender counties were contacted for semi-structured telephone interviews. Contact information for these pharmacists was obtained from the UNC Cecil G. Sheps Center for Health Services Research, which had access to contact information for all licensed pharmacies located in those regions. Eligible managers were currently licensed pharmacy managers of outpatient dispensing community and ambulatory care pharmacies located in the five counties comprising the Southeast Area Health Education Center (SEAHEC). Ambulatory care pharmacies were further categorized by their managers as either clinic-based pharmacies or outpatient health system pharmacies. Pharmacy managers of other types of pharmacies (e.g., long-term care pharmacies, nuclear pharmacies, inpatient hospital pharmacies, etc.) were not eligible to participate.

An invitation to participate was emailed to 145 out of 147 pharmacy managers (two did not have useable email addresses) in January 2022 containing a brief introduction to the study and the option to opt out. The managers were told that the UNC Eshelman School of Pharmacy was eager to increase its efforts in serving Eastern North Carolina, and one area where the school was expanding their presence was the SEAHEC region. The invitation explained the team's interest in interviewing pharmacists who practice in community and ambulatory care settings in the SEAHEC counties to assess the status of practice and goals for expanding practice.

All pharmacy managers who did not opt out of the study received a telephone screening call to confirm their eligibility, obtain verbal consent to participate, and schedule the interviews. The eligibility screening question was "Is your pharmacy either a community pharmacy, clinic-based pharmacy, or outpatient health system pharmacy?". Eligible managers were allowed to designate an alternate person to participate in their place if the alternate was a licensed pharmacist or licensed pharmacy technician employed by the same pharmacy. Participation in the study was voluntary and confidential.

The interviews were conducted by telephone between February and May of 2022 by members of the study team at the times scheduled during the screening calls. Interview questions were formulated based on a combination of operational characteristics of pharmacies, Community Pharmacy Enhanced Services Network's list of "enhanced services," and the new services expanded by NC legislature.^{3,6,27} The interview questions are included in the supplementary materials.

Pharmacy managers received a \$20 Amazon gift card as compensation for their participation. The interviews consisted of seven sections, which included pharmacy characteristics, patient services, enhanced dispensing authority, expansion of services, pharmacy student engagement, integration of care, and non-pharmacist personnel.

Measurement

Pharmacy Characteristics: Participants were asked about the pharmacy characteristics (Table 1), including type of pharmacy, size of the pharmacy's practice, and membership status in network organizations such as the Community Pharmacy Enhanced Services Network (CPESN). Participants were then asked if they were interested in learning more about such organizations.

Patient Services: Participants were asked whether their pharmacy provides each of the services listed in Table 2 on at least a monthly basis. Examples included: home delivery, blood pressure screening, and naloxone dispensed without a prescription. If a participant indicated that their pharmacy offered disease state management program(s), a series of follow-up questions were asked at the end of the interview to

determine additional details about the program(s) such as method of delivery and compensation.

Emerging Patient Services: For each of the following services newly available in North Carolina, participants were asked whether their pharmacy offered the service or was planning to offer the service: influenza vaccine for children ages 10 to 18, nicotine replacement therapy, oral and/or transdermal contraceptives, prenatal vitamins, HIV PEP, glucagon to treat severe hypoglycemia, and administration of LAIs.

Expansion of Services: Participants were asked to identify up to five of the patient services listed in Table 2 that they would like to attend continuing education courses or receive help in learning how to provide. Participants were then asked to designate one of these services as “highest priority” for wanting continuing education programs or help in learning how to provide.

Pharmacy Learner Engagement: Participants were asked whether their pharmacy offers pharmacy student rotations or postgraduate year one (PGY1) residency programs. Participants were also asked to identify examples of patient care that pharmacy students help to deliver while on rotation.

Integration of Care: Participants were asked questions related to the employment of a clinical pharmacist practitioner (CPP) at their pharmacy. A CPP is a pharmacist licensed to provide drug therapy management under the supervision of a licensed physician.³⁵ Participants were also asked about their pharmacy’s access to patient electronic health records (EHR).

Non-Pharmacist Personnel: Participants were asked about the employment of health care professionals other than pharmacists at their pharmacy, including nurses, physical therapists, and dietitians.

Analysis

All analyses were conducted using SPSS (IBM SPSS Version 26, Armonk, New York). Descriptive statistics for all variables were computed. Then bivariate relationships between provision of services and whether a pharmacy was a chain (more than four locations under same owner) or an independent (four or fewer locations under same owner) were examined using Fisher’s exact tests.

Results

Of the 145 pharmacy managers invited to participate in the study, 116 met our inclusion criteria, and forty-four agreed to participate (38% response rate). Table 1 contains the pharmacy characteristics. The majority of the pharmacy managers were employed by either a community chain pharmacy (56.8%) or a community independent pharmacy (34.1%). Most pharmacies (65.9%) employed two full-time pharmacists. Out of a three-tiered system indicating level of economic distress, the majority of pharmacies were located in Tier 3 counties (81.8%, least

distressed), and the rest were located in Tier 1 counties (18.2%, most distressed). None of the SEAHEC counties were Tier 2 counties.

Patient Services Provided by the Pharmacies

The most common services offered by represented pharmacies include medication synchronization services (93.2%), on-site immunizations (90.9%), and refill reminders (88.6%). The least common services offered include INR screens (0%), A1c screens (7%), and the four ‘incident-to’ billing services associated with CPT codes: annual wellness visits (0%), chronic care management (0%), transitional care management (0%), and remote patient monitoring (2.4%).

Table 2 contains the patient services offered and the emerging services offered or planned to be offered under new North Carolina legislation by pharmacy type (independent versus chain). In descending order, the emerging services that participants either offered or planned to offer included: influenza vaccines for children ages 10 to 18 years (86%), oral or transdermal contraceptives (52%), prenatal vitamins (52%), nicotine replacement therapy (48%), LAIs (37%), glucagon to treat severe hypoglycemia (36%), and HIV PEP (14%).

Independent pharmacies were significantly more likely to dispense or plan to dispense prenatal vitamins (80%) and glucagon (73%) than chain pharmacies (40% and 8.3%, $p=0.02$ and $p=0.00$, respectively). Chain pharmacies were significantly more likely to dispense or plan to dispense influenza vaccines for children ages 10 to 18 years (100%) than independent pharmacies (73%) ($p=0.01$). Emergency contraception was also significantly more likely to be sold at chain pharmacies (92%) compared to independent pharmacies (47%) ($p = 0.0024$).

Expansion of Patient Services and Need for Continuing Education

Table 3 presents the services that were a priority for the pharmacies to offer in the future. The areas that participants most often identified as one of their top five priorities for continuing education to offer in the future included: oral/transdermal contraceptives (60.5%), administration of LAIs (36.8%), and administration of PEP (23.7%). Some participants identified topics they were interested in continuing education that were not included in the interview, such as natural therapies, diabetes education programs, and pharmacogenomics. Of note, nearly half of the pharmacy managers (45.5%) identified oral/transdermal contraceptives as the single highest interest area for continuing education because it was a priority service that they wanted to offer in the future.

Pharmacy Learner Engagement

When asked about student rotations, 37% of pharmacies offered Introductory Pharmacy Practice Experiences (IPPE) and 25.6% offered Advanced Pharmacy Practice Experiences

(APPE). Of the 27 pharmacies that offered neither IPPE nor APPE, 67% affirmed the capacity to accept more students.

Of the pharmacies that did offer student rotations, 25% reported pharmacy students spent at least half of their time engaged in the dispensing workflow (“technician duties”), whereas 46.7% reported that students spent at least half of their time on starting, improving, or delivering patient care. Examples of these patient care included immunizations (75%), prescription drug counseling (50%), over-the-counter drug counseling (18.8%), medication therapy management calls (18.8%), and comprehensive medication reviews (18.8%).

Although none of the pharmacies offered a PGY1 residency program, 26% were interested in starting a new residency program (10 out of 38); 40% of independent pharmacies (6 out of 15) and 19% of chain pharmacies (4 out of 21) expressed interest.

Integration of Care and Non-Pharmacist Personnel

Four pharmacies (9.3%) reported that their pharmacy employed a CPP, including two chain and two independent pharmacies. Although five pharmacies (11.4%) had reading access to the patient EHR, three of these were affiliated with clinics as opposed to being freestanding community pharmacies. None of the independent pharmacy managers had access to EHR. Only two pharmacies (4.7%) employed health professionals besides pharmacists, including one chain pharmacy employing a registered nurse and another chain pharmacy employing a nurse practitioner. Although none of the pharmacies belonged to the practice-based research network Rural Research Alliance of Community Pharmacies (RURAL-CP) and only 4.7% belonged to the Community Pharmacy Enhanced Services Network (CPESN), the majority of pharmacies were interested in learning more about these networks through continuing education programs (69.8% and 66.7%, respectively).

Discussion

Pharmacy managers most often identified oral/transdermal contraceptives, administration of LAIs, and administration of HIV PEP as one of their top five continuing education priorities for the future. In a different project, over 50% of surveyed North Carolina pharmacists believed that oral contraception should be classified as pharmacist-prescribed.²⁸ Other studies indicated that pharmacists were more likely to favor pharmacist-prescribed contraceptives if they were residency trained and/or felt well-trained to prescribe contraceptives.^{28,29} Organizations such as the CPESN and the North Carolina Pharmacists Association offer continuing education that may improve pharmacist knowledge on expanding these types of services.³⁰⁻³² However the results from this study imply there are not enough continuing educational programs on topics about the expanding roles of pharmacists. Schools of Pharmacy and other pharmacy organizations should prioritize offering continuing education on the topics pharmacy managers most

highly identified for future pharmacist education to help pharmacists in community and ambulatory care settings prepare for their expanding roles.

The majority of participants wanted to learn about the Agency for Health Care Research and Quality practice-based research network RURAL-CP and CPESN through continuing education programs. Pharmacies in the CPESN network have the capacity to provide enhanced patient services in addition to prescription fulfillment and patient education.^{27,33-34} These enhanced services might result in improved patient adherence.³⁴ Future work should examine how pharmacy involvement with these organizations increases their provision of patient services and patient health outcomes, especially those services that were recently expanded by the North Carolina legislature.^{6,35}

Among independent and chain pharmacies, there were many significant differences in the rates and types of patient services provided. Future research should examine why emergency contraception was more likely to be sold and why on-site immunizations were more likely to be given in chain pharmacies. Likewise, future research should also examine why independent pharmacies were significantly more likely to offer prenatal vitamins and glucagon to their patients than chain pharmacies. Examining the differences in why independent and chain pharmacies deliver certain services at different frequencies could provide insight on how to expand access to these types of services overall.

Both independent and chain pharmacies had low-to-nonexistent offerings of services such as INR screens, A1c screens, chronic care management and transitional care management among others. Future research could focus on why these services are not more frequently offered in SEAHEC pharmacies and on if their addition into pharmacies could improve medication adherence and patient follow-up, especially in underserved regions where pharmacies can act as an accessible point of patient engagement.

Almost half of the participants reported that pharmacy students on rotations spent 50% or more of their time starting, improving, or delivering patient care services. Patient care services delivered by pharmacy students can be mutually beneficial to both students and community pharmacies. Students can practice essential clinical skills while community pharmacies can provide patients with increased access to patient care. Although none of the pharmacies had a PGY1 residency program, 26% of participants stated that they would be interested in starting one. A larger percentage of independent pharmacies than chain pharmacies were interested in starting a residency program. Schools of Pharmacy should continue to work with community and ambulatory care pharmacies by placing students and residents in rural communities to advance the provision of patient care services, improve patient health outcomes, and develop sustainable business models.

Future work should examine what types of pharmacists are more likely to innovate and offer expanded pharmacy services. Diffusion of Innovations theory could guide future research.^{36,37} The theory states that, adopters (e.g. pharmacists) make choices on whether to embrace an innovation (e.g. offer a new service) by examining the uncertain benefits and risks of the new innovation to the pharmacist or pharmacy.³⁷ Schools of Pharmacy could help pharmacists capitalize on the benefits and minimize the risks of new services through continuing education programs. In addition to diffusions of innovations theory, implementation science can also guide successful strategies for expansion and implementation of patient care services in community pharmacy settings.^{38,39} There are some studies in community pharmacies that have demonstrated success with integrating EHR access,³⁹⁻⁴¹ expanding technician roles,⁴²⁻⁴⁶ and collaborating with primary care providers for patient care services.⁴⁷⁻⁵⁰ Using diffusion of innovation theory and implementation science research can further add to the literature for expansion of patient care services in community pharmacies.

The study is limited in that it focused on one geographic region of North Carolina. Another limitation is the small sample size and 38% response rate, which precluded meaningful statistical comparisons between pharmacies in Tier 1 versus Tier 3 counties. Additionally, during the survey, no time frame was referenced for when pharmacies would plan to offer the future services categorized in Table 2. Future research should examine the extent to which pharmacies across North Carolina intend to offer emerging patient services, the timelines in which they plan to do so, and how these new offerings might vary in different areas of the state. Future work could also examine whether the types of services offered or planned to be offered varies by tier 1, 2 or 3 counties. Pharmacists could especially make a big difference in public health in the more distressed (tier 1) counties by offering expanded services such as contraception, HIV PEP, and the administration of LAIs.

Conclusions

Pharmacies in the five southeastern North Carolina counties are offering or are planning to offer many patient services that go beyond traditional dispensing. The continuing education programs that pharmacy managers would most like having access to in the future include oral/transdermal contraceptives, administration of LAIs, and dispensing of HIV PEP. Pharmacy organizations should prioritize continuing education on these topics to assist pharmacists in community and ambulatory care settings prepare for their expanding roles.

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The opinions expressed in this paper are those of the author(s).

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Table 1. Characteristics of the pharmacies, N = 44

Characteristic	n (Percent)
Pharmacy type	
Community pharmacy: Independent	15 (34.1)
Community pharmacy: Chain	25 (56.8)
Clinic-based	3 (6.8)
Unknown	1 (2.3)
Number of full-time pharmacists employed	
1	11 (25.0)
2	27 (61.4)
3	3 (6.8)
Unknown	3 (6.8)
Number of pharmacy technicians employed	
1-2	5 (11.4)
3-5	19 (43.2)
6-9	14 (31.8)
10+	3 (6.8)
Unknown	3 (6.8)
Number of prescriptions filled in average weekday	
Less than 150	6 (13.6)
150-299	16 (36.4)
300-499	11 (25.0)
500+	6 (13.6)
Unknown	5 (11.4)
County	
Brunswick	15 (34.1)
Columbus	7 (15.9)
Duplin	1 (2.3)
New Hanover	14 (31.8)
Pender	7 (15.9)
North Carolina county development tier designations	
Tier 1 (most distressed)	8 (18.2)
Tier 2	0 (0.0)
Tier 3 (least distressed)	36 (81.8)

Table 2. Patient services provided and enhanced dispensing authority services (without a prescription) offered or planned to offer by pharmacy type (independent vs. chain), N = 40

Service type	Independent n (Percent)	Chain n (Percent)	P- value*
	15 (37.5)	25 (62.5)	
Patient Services			
Refill Reminders	12 (80.0)	25 (100.0)	0.0461
Adherence Packaging	11 (73.3)	14 (56.0)	0.3288
Home Delivery	12 (80.0)	21 (84.0)	1.000
Medication Synchronization	14 (93.3)	24 (96.0)	1.000
Multilingual Staff	6 (40.0)	7 (28.0)	0.4983
Tobacco Cessation Education	5 (33.3)	13 (52.0)	0.3319
Substance Misuse Education Program	7 (46.7)	6 (24.0)	0.1748
Disease State Management Program	3 (20.0)	8 (32.0)	0.4861
Community Health Educational Events	7 (46.7)	5 (20.0)	0.0909
On-Site Immunizations	12 (80.0)	25 (100.0)	0.0461
Off-Site Immunizations ¹	9 (64.3)	18 (72.0)	0.7232
Comprehensive Medication Review	13 (86.7)	15 (60.0)	0.1523
Emergency Contraception Sold	7 (46.7)	23 (92.0)	0.0024
Blood Pressure Screening	11 (73.3)	18 (72.0)	1.000
CLIA-Approved Point of Care Testing ¹	7 (50.0)	17 (68.0)	0.3182
COVID-19 screen	6 (40.0)	12 (48.0)	0.7470
Influenza screen	4 (26.7)	6 (24.0)	1.000
Durable Medical Equipment Sales & Billing	4 (26.7)	5 (20.0)	0.7053
Home Visits Excluding Deliveries	3 (20.0)	0 (0.0)	0.0461
Medication Compounding	11 (73.3)	12 (48.0)	0.1874
Syringes Sold Without a Prescription	8 (53.3)	18 (72.0)	0.3101
Naloxone Dispensed Without a Prescription	9 (60.0)	18 (72.0)	0.4983
Services pharmacies offer or plan to offer			
Influenza vaccine for children aged 10 to 18	11 (73.3)	25 (100.0)	0.0149
Nicotine Replacement Therapy	10 (66.7)	10 (40.0)	0.1908
Oral and/or Transdermal Contraceptives	7 (46.7)	14 (56.0)	0.7451
Prenatal Vitamins	12 (80.0)	10 (40.0)	0.0217
HIV Post-exposure Prophylaxis (PEP) ¹	4 (26.7)	2 (8.3)	0.1803
Glucagon to treat severe hypoglycemia	11 (73.3)	4 (16.0)	0.0005
Administration of long-acting injectables with a prescription ¹	8 (53.3)	7 (29.2)	0.1817

*P-values based on Fisher's exact test.

¹Total N = 39

Table 3. Future priority services that pharmacies plan to offer and would like to receive continuing education or help in learning how to provide

Services Offered	One of Their Top 5 Priorities for Continuing Education n (Percent) N=38 responded	Highest Priority for Continuing Education n (Percent) N=33 responded
On-Site Immunizations	3 (7.9)	2 (6.1)
Emergency Contraception Sold	2 (5.3)	0 (0)
CLIA-Approved Point of Care Testing	3 (7.9)	1 (3.0)
Medication Compounding	1 (2.6)	0 (0)
Annual Wellness Visit	3 (7.9)	2 (6.1)
Chronic Care Management	3 (7.9)	1 (3.0)
Transitional Care Management	3 (7.9)	1 (3.0)
Remote Patient Monitoring	2 (5.6)	0 (0)
Nicotine Replacement Therapy	3 (7.9)	1 (3.0)
Oral and/or Transdermal Contraceptives	23 (60.5)	15 (45.5)
HIV Post-exposure Prophylaxis (PEP)	9 (23.7)	3 (9.1)
Glucagon to treat severe hypoglycemia	3 (7.9)	1 (3.0)
Administration of long-acting injectables (LAIs) with a prescription	14 (36.8)	2 (6.1)
New legislation and services (Section B services)	2 (5.3)	0 (0)
Guideline updates for common disease states	1 (2.6)	1 (3.0)
Natural therapies	1 (2.6)	1 (3.0)
Diabetes education program	2 (5.3)	1 (3.0)
Tobacco Cessation Education	1 (2.6)	0 (0)
Substance Misuse Education Program	1 (2.6)	0 (0)
Pharmacogenomics	1 (2.6)	0 (0)
Services billable through CPT codes	1 (2.6)	0 (0)
Prenatal Vitamins	1 (2.6)	0 (0)