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Stages of Change: Moving Community Pharmacies From a Drug Dispensing to Population Health Management Model

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Abstract

Given their clinical training and accessibility, community pharmacists are well positioned to support primary care, especially in providing medication management services. There is limited evidence, however, on implementation of community pharmacist-led services in coordination with other health care providers. The aim of this study was to examine the implementation process of community pharmacies in North Carolina participating in a Medicaid population health management intervention. We conducted semistructured interviews with 40 representatives from high- and low-performing community pharmacies from June to August 2017. We analyzed for themes organized around Rogers's Stages in the Innovation Process in Organizations. Community pharmacies employed numerous implementation strategies such as developing relationships with providers and redefining job responsibilities to ensure pharmacists and pharmacy technicians are working at the top of their license. Findings also revealed differences in the implementation process among high- and low-performing pharmacies. Continued research is needed to determine which implementation strategies improve program performance.

Keywords

community pharmacy; implementation science; medication management; implementation strategies; stages of implementation

Introduction

The aging of our population, the increasing prevalence of chronic illnesses, and the expansion of insurance coverage are expected to increase demand for primary care in the next 10 years (Anderson, Goodman, Holtzman, Posner, & Northridge, 2012; Bodenheimer

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& Pham, 2010; Dall et al., 2013; Ghorob & Bodenheimer, 2012; Ward, Schiller, & Goodman, 2014). Patient complexity will also increase as the number of patients with multiple chronic conditions grows, requiring more time and resources from primary care (Bodenheimer, Chen, & Bennett, 2009; Shulman et al., 2009). However, access to primary care providers (PCPs) is projected to be insufficient due to workforce shortages and uneven geographic distribution (Bodenheimer & Pham, 2010; Ghorob & Bodenheimer, 2012; Green, Savin, & Lu, 2013). To strengthen primary care capacity, innovative solutions are needed, including redistributing primary care functions to other health care team members (Ghorob & Bodenheimer, 2012; Green et al., 2013).

Given their clinical training and accessibility, community pharmacists are well-positioned to support primary care, especially in providing medication management services (Kennedy, Chen, Corriveau, & MacLean, 2015; M. Smith, Bates, Bodenheimer, & Cleary, 2010; M. Smith, Bates, & Bodenheimer, 2013). Community pharmacists receive doctoral-level training that is increasingly focused on direct patient care, population health, and coordination with other health care professionals (Saseen et al., 2017). Community pharmacists are also geographically accessible to most patients; nearly 90% of the population lives within 5 miles of a community pharmacy (Centers for Disease Control and Prevention, 2017; National Association of Chain Drug Stores, 2014). Additionally, patients managing chronic conditions frequently visit community pharmacies. A recent study found that Medicaid patients with multiple chronic conditions had 10 times the annual visits to their community pharmacy compared with their PCP (35 vs. 3.5) (Community Care of North Carolina [CCNC], 2016). Therefore, community pharmacies may be an ideal setting to deliver medication management services.

Community pharmacist-led medication management services have proven valuable by reducing medication errors, improving adherence, reducing hospital readmissions, and decreasing health care costs (Blalock, Roberts, Lauffenburger, Thompson, & O'Connor, 2013; Brown et al., 2016; Mehuys et al., 2011; Messerli, Blozik, Vriends, & Hersberger, 2016; Ottenbros et al., 2014; M. Smith, Giuliano, & Starkowski, 2011; Van Wijk, Klungel, Heerdink, & de Boer, 2005; Viswanathan et al., 2015). Although their value has been demonstrated, these services have been underutilized in alternative payment models (M. Smith et al., 2010; M. Smith et al., 2013) due to payer and state regulations that limit community pharmacists' ability to bill for medication management (Maine, Knapp, & Scheckelhoff, 2013; M. Smith et al., 2013).

Given the small number of models in practice, there is limited evidence on how to integrate community pharmacist-led medication management services into primary care delivery (M. G. Smith et al., 2017). Implementing these services requires community pharmacies to establish new relationships with PCPs and move from a drug dispensing to population health management model. Because population health management interventions often affect the entire organization rather than targeted units or departments, they require large-scale changes to care organization and delivery (Felt-Lisk, 2011; McCarthy, Klein, & Cohen, 2014; Steenkamer, Drewes, Heijink, Baan, & Struijs, 2017). Past studies of innovation implementation have focused on interventions that affect a single dimension of an organization (Lee, Weiner, Harrison, & Belden, 2013). Therefore, research is needed on how

to implement large-scale organizational change (Best et al., 2012; Lee et al., 2013), particularly in community pharmacy settings where these interventions are being tested for the first time. To address this need, we examine the implementation process of community pharmacies in North Carolina participating in a population health management intervention. Our objectives are to (1) compare implementation strategies of high- and low-performing community pharmacies at different stages of the innovation implementation process and (2) identify the implementation strategies that pharmacies use to sustain the innovation.

New Contribution

In this article, we explore how high- and low-performing community pharmacies implement a complex population health management model at different stages of the innovation process. This study contributes to the health services research literature by examining the implementation process of a complex innovation that affects multiple facets of an organization, which is an understudied area in implementation science (Best et al., 2012; Lee et al., 2013). This study is also the first to our knowledge to examine the implementation process of an intervention that emphasizes care coordination between community pharmacists and other health care providers. As health care systems move toward increasing integration (e.g., CVS-Aetna merger), additional research is needed to identify implementation strategies that support care integrated across otherwise disparate providers (e.g., community pharmacists, PCPs).

Conceptual Framework

Process models recognize a temporal order of implementation activities and can guide practitioners on how to implement innovations (Damschroder et al., 2009; Nilsen, 2015). Although there is diversity across process models (e.g., linear vs. iterative), three stages are common across models: preimplementation, implementation, and sustainment (Aarons, Hurlburt, & Horwitz, 2011; Bergh et al., 2005; Canadian Institutes of Health Research, 2016; Chamberlain, Brown, & Saldana, 2011; Davis, Peterson, Helfrich, & Cunningham-Sabo, 2007; Ettlie, 1980; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Meyers, Durlak, & Wandersman, 2012; Rogers, 2010; Wilson, Brady, Lesesne, & NCCDPHP Work Group on Translation, 2011). We chose Rogers's Stages in the Innovation Process in Organizations because it has been applied to a wide variety of innovations (Rogers, 2010).

Preimplementation begins with the innovation–adoption process during which organizations identify the need for innovation (e.g., performance gap) and strategies that might meet the organization's needs ("agenda-setting") and is the right fit for the organization ("matching") (Rogers, 2010). Organizations may identify the need for innovation by recognizing and seeking innovations to address a problem ("problem-initiated approach") (Rogers, 2010). More commonly, however, organizations become aware of an innovation and evaluate whether it could solve broader organizational problems ("innovation-initiated approach") (Rogers, 2010). Metrics to assess fit include organizational capacity, staff, and patient acceptability, and compatibility with the organization's mission (Davis et al., 2007; Helfrich, Savitz, Swiger, & Weiner, 2007; Meyers et al., 2012; Rogers, 2010; Weiner et al., 2017). Organizations might also consider aspects of the innovation itself—such as its complexity (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004; Rogers, 2010), environmental

context (e.g., external funding, political climate), and adoption decisions of competitors (Aarons et al., 2011; Damschroder et al., 2009; Fixsen et al., 2005; Greenhalgh et al., 2004; Rogers, 2010).

The implementation stage begins once an organization decides to adopt an innovation (Fixsen et al., 2005; Rogers, 2010). To prepare for implementation, the organization may change its structure including hiring and training personnel, purchasing equipment, and/or developing policies and procedures (Chamberlain et al., 2011; Fixsen et al., 2005; Helfrich et al., 2007; Rogers, 2010). Additionally, organizations go through a redefining process to adapt the innovation to its context and needs (Rogers, 2010; Stirman, Miller, Toder, & Calloway, 2013). After an organization has gained experience with implementation, it may refine its implementation process and scale up the innovation within the organization; this is called the clarifying stage (Rogers, 2010). The clarifying stage might also involve reflection and evaluation on the implementation process (Davis et al., 2007; Fixsen et al., 2005; Meyers et al., 2012).

During sustainment, organizations make the intervention a routine, sustainable part of the organization (i.e., the routinizing stage). An organization might allocate personnel permanently to be responsible for implementation, incorporate the innovation into the organizations' standards or protocols, or devote part of the budget to implementation (Bergh et al., 2005; Davis et al., 2007; Fixsen et al., 2005; Helfrich et al., 2007).

Within these three stages, practitioners may use different implementation strategies to support the implementation process. Implementation strategies are "methods or techniques used to enhance the adoption, implementation, and sustainability of a clinical program or practice" (Powell et al., 2012; Powell et al., 2015; E. K. Proctor, Powell, & McMillen, 2013). Implementation strategies can fall into several categories including plan, educate, restructure, quality-management, and finance strategies (Powell et al., 2012; Powell et al., 2015) (see Supplemental Material available in the online version of the article).

Method

Intervention Description

The Community Pharmacy Enhanced Services Network (CPESNSM) is a national network of community pharmacies that have agreed to offer a set of medication management services (CPESN-USA, 2017). This study examines the North Carolina CPESN (NC-CPESN), the pioneer CPESN site (CCNC, 2016). The NC-CPESN was launched in 2014 by the CCNC—the primary case management provider for NC Medicaid beneficiaries (CCNC, 2016, 2017). NC-CPESN not only requires community pharmacies to provide certain medication management services, but also holds pharmacies responsible for the outcomes of a defined patient population through value-based payment. Additionally, participating pharmacies must document their medication management services and patients' clinical information in a web-based platform provided by CCNC. Pharmacies participating in NC-CPESN received technical assistance from CCNC on how to document and deliver medication management services (Turner et al., 2018).

Selection of Study Sites

Because pharmacies could enroll at the beginning of the program year in 2014 (first year of the program), 2015, or 2016, they have varying levels of experience with NC-CPESN. Pharmacies in NC-CPESN also represent very different settings (e.g., independently owned pharmacies, chain pharmacies, and outpatient pharmacies). To obtain diverse perspectives about implementation, we recruited 24 high- and 16 low-performing pharmacies on selected measures (e.g., medication adherence, emergency department utilization, hospital admissions, and total health care costs). These measures are used by CCNC to determine pharmacies' performance level in NC-CPESN and therefore, to be consistent, we chose these measures to assess performance. High-performing pharmacies were defined as pharmacies that had an above or at the mean overall performance score ($\mu = 6.1$) compared with all pharmacies participating in NC-CPESN (e.g., a score that is an aggregate measure of the performance measures listed above and ranges from 0 to 11) whereas low performing was defined as having a score below the mean. Pharmacy performance was measured in the quarter prior to the collection of qualitative data (April/June 2017).

To recruit participants, we randomly selected 20 high- and 20 low-performing pharmacies. We offered participants a \$50 gift card for study participation. Five pharmacies declined to participate due to lack of time. Therefore, we asked study participants to suggest additional participants, and we were able to recruit an additional five participants. To identify interviewees, we asked pharmacies to identify the individual in their pharmacy responsible for NC-CPESN implementation. We stopped recruitment after 40 pharmacies when clear patterns began to emerge in the data (theme saturation) (Guest, Bunce, & Johnson, 2006).

Data Collection

Two trained research assistants (KT and CR) conducted 40 semi-structured interviews (mean = 51 minutes) from June to August 2017 to understand individual perspectives about NC-CPESN implementation (Ulin, Robinson, & Tolley, 2004). The interview guide was based on Rogers's theory (Rogers, 2010). Interviews were conducted over the phone to facilitate participation across the State. The interviews were audio-record and transcribed verbatim. Participants provided informed consent over the phone. The Institutional Review Board of the University of North Carolina at Chapel Hill approved this study (IRB # 17-1304).

Data Analysis

We used Dedoose (Version. 7.0) to generate deductive codes based on Rogers's theory (Rogers, 2010; Ulin et al., 2004) and the five categories of implementation strategies: plan, educate, restructure, quality-management, and finance (Powell et al., 2012; Powell et al., 2015). We did not include implementation strategies related to the policy context since interviewees did not discuss these strategies. Two members of the research team (KT and CR) coded five transcripts to: determine how similarly codes were being applied and reach consensus on code definitions (Ulin et al., 2004). Once we coded the data, we developed a matrix to compare which implementation strategies were used by high- and low-performing pharmacies and calculated the proportion of high- and low-performers that used each strategy (see Supplemental Material). One author (KT) coded the remaining transcripts. A summary was sent to five interview participants (three high- and two low-performing

pharmacies) to confirm the findings; this member-checking process helps ensure that the interpretation is consistent with study participants' experiences (Creswell & Miller, 2000). Interview participants who were consulted agreed with the interpretation of the findings and did not suggest any modifications. We used the Consolidated Criteria for Reporting Qualitative Studies checklist to guide our reporting of qualitative methods and findings (Tong, Sainsbury, & Craig, 2007).

Results

Sample Characteristics

Nearly half of 40 participants had a single role as a pharmacist (Table 1). Participants came from multiple pharmacy settings, including single independent pharmacies (20%), multiple independent pharmacies (50%), chain pharmacies (10%), and outpatient pharmacies including federally qualified health centers (20%). This distribution is similar to pharmacies participating in NC-CPESN.

Preimplementation Stage: High-Performing Pharmacies

Agenda Setting.—High-performing pharmacies discussed two planning implementation strategies to support the agenda-setting process: conducting site visits to other pharmacies to learn about their experiences with NC-CPESN and conducting a local needs assessment to determine whether there was a need for NC-CPESN in the pharmacy. During site visits, pharmacies gathered information about NC-CPESN, such as ease-of-implementation and the usability of the required documentation software. Pharmacies also evaluated whether NC-CPESN would meet the pharmacies' needs, including patients' needs, financial needs, and performance gaps. Pharmacies varied in the order these strategies were initiated. Some pharmacies first identified the need for innovation and then conducted an environmental scan to identify potential solutions ("problem-initiated approach"). One pharmacy technician described her pharmacy's process as, "We're constantly looking for ways to improve our performance. Our clinical pharmacist was researching clinical services and came across NCCPESN." Other pharmacies, through their employees' social networks, leadership ties, and relationships with professional and academic organizations, learned about NC-CPESN and then determined whether NC-CPESN would meet their pharmacy's needs ("innovation-initiated approach").

Matching.—Pharmacies used three planning strategies to determine whether NC-CPESN was a good match for their pharmacy. Pharmacies first assessed their pharmacy's readiness for NC-CPESN. Specifically, pharmacies assessed fit with the pharmacy's mission (e.g., impact on patient care and outcomes) and whether the pharmacies' organizational capacity to support NC-CPESN (e.g., staffing and resource availability, workspace). Second, pharmacies conducted local consensus discussions with external stakeholders (e.g., PCPs, care managers) and internal stakeholders (e.g., pharmacy personnel) to obtain their buy-in. For external stakeholders, participants recommended discussing NC-CPESN's purpose and identifying whether or not NC-CPESN would meet the needs of other health care providers' patient population. For example, a pharmacy manager described: "We went to the providers that we already had a good relationship with and asked them if they would like to participate

and whether it would be helpful for their patients.” For internal stakeholders, pharmacies discussed the importance of communicating information about NC-CPESN’s purpose, fit with the pharmacy’s mission, impact on staff roles, and implementation. Finally, participants identified both potential barriers to implementation (e.g., resistance among personnel and providers) and strategies for addressing challenges (e.g., including personnel in the planning process).

Preimplementation Stage: Low-Performing Pharmacies

Agenda Setting.—Unlike high-performing pharmacies, low-performing pharmacies did not visit other sites to learn about other pharmacies’ experiences with NC-CPESN or conduct a local needs assessment to determine whether the pharmacy had a need for NC-CPESN (e.g., patient needs). As an example, one pharmacy manager described, “We have a small percentage of Medicaid patients and thinking back on when we enrolled in the program, I don’t think we had the critical mass needed to justify this intervention and how much time we’ve spent on it.”

Matching.—Low-performing pharmacies used planning strategies to determine if NC-CPESN was a good match for their pharmacy. Low-performing pharmacies, for example, assessed whether NC-CPESN fit with the pharmacy’s mission and organizational capacity, such as a pharmacy management system that supports medication synchronization. Low-performing pharmacies, however, failed to assess whether their pharmacy had sufficient staffing for NC-CPESN. Specifically, these pharmacies did not consider how much pharmacist time, outside of the time allotted to dispensing, would need to be dedicated to medication management services. Low-performing pharmacies also failed to identify potential implementation barriers (e.g., lack of patient engagement) and strategies for addressing those barriers, and failed to have local consensus discussions with external and internal stakeholders. One pharmacy owner explained,

If I could go back, that’s something I’d change. Don’t wait until six months down the road, when you’ve already started the program, to tell them [personnel], this is what I want you to do. Because they won’t understand why you’re doing what you’re doing and they’ll be resistant.

Implementation Stage: High-Performing Pharmacies

Restructuring.—During implementation, participants from high-performing pharmacies used planning and education implementation strategies. They developed a formal implementation blueprint, recruited and designated personnel for implementation leadership positions, identified and prepared NC-CPESN champions, and pilot-tested medication management services with a small number of patients and personnel. Pharmacies typically appointed pharmacists as implementation leaders responsible for developing implementation blueprints, training staff, and monitoring implementation efforts. Interestingly, pharmacies typically appointed pharmacy technicians to serve as NC-CPESN champions, including gaining buy-in for NC-CPESN among staff and patients. To educate pharmacy personnel on NC-CPESN, some pharmacies used a train-the-trainer approach, whereas others cross-trained multiple staff members on NC-CPESN activities. Participants emphasized the

importance of training personnel not only on the intervention but also clinical training, especially for pharmacy technicians.

Pharmacies used several strategies during the restructuring phase. They redefined job roles to include NC-CPESN activities, for example, appointing personnel to be responsible for recruiting patients for medication management services, delivering medication management services, or documenting services in the pharmacy's management system. Some pharmacies hired new personnel to support NC-CPESN implementation—most commonly, clinical pharmacists and data entry specialists. Many pharmacies obtained advice from software vendors on how to use their existing pharmacy management software alongside of the CCNC-provided software to support NC-CPESN implementation. One pharmacy owner said, "Whenever we start something new like NC-CPESN, we start with our software vendor. We explain what we are trying to implement, what we'd like the software to do, and ask them if it is possible."

A smaller number of high-performing pharmacies used quality-management strategies (e.g., developing and organizing quality-monitoring systems) to track performance data from their management system and share performance data with personnel (e.g., success stories and areas of improvement). Some pharmacies also developed posters, webinars, and report cards that visually compared current progress on performance measures.

Redefining.—High-performing pharmacies used several planning strategies to adapt NCCPESN to the pharmacy's local context. For example, pharmacies tailored the intervention to better meet patients' needs including its setting (e.g., using a public location or provider's office for homeless patients requiring home services), the mode of delivery (e.g., using delivery drivers to collect patient information), and the cost (e.g., lowering patient fees for low-income patients). One pharmacist explained, "We started seeing a trend that we knew that our delivery drivers were our eyes and ears in the field. And it grew organically from there where we started using our drivers to support our adherence programs." Participants also developed processes for prioritizing patients for medication management services such as using information collected during the patient encounter (e.g., availability of transportation).

High-performing pharmacies were more purposeful about establishing relationships with PCPs, care managers, and patients. Prior to adopting NC-CPESN, many participants engaged with PCPs by fax and very rarely interacted with CCNC care managers. With NC-CPESN, participants reported setting up face-to-face meetings with PCPs and care managers to discuss NC-CPESN overall as well as specific patient cases. Pharmacies used motivational interviewing techniques to build rapport with patients prior to introducing medication management services to them. Additionally, participants collaborated with PCPs and care managers to engage hard-to-reach patients. One pharmacy manager explained, "We have some patients that receive information better from their medical providers than from pharmacy staff. So we'll call the physician and get them to reinforce what we've recommended to the patient."

Clarifying.—Participants from high-performing pharmacies expanded medication management services using planning (e.g., staging implementation scale-up) and education (e.g., creating and distributing materials) strategies. They planned an implementation scale-up by enhancing outreach to recruit additional patients, increasing the number of personnel involved in service delivery, and partnering with community-based organizations, such as local agencies for aging services. Additionally, pharmacies developed and distributed educational materials to patients, including flyers, brochures, and tags stapled to prescription bags.

Pharmacies also adjusted their implementation processes after gaining experience with NC-CPESN. They used restructuring strategies such as redefining professional roles based on experiences with implementation. For example, pharmacies matched hard-to-reach patients with a staff member who successfully engaged them. Some pharmacies also employed quality-management strategies such as purposefully reexamining implementation to determine if their pharmacy's processes should be adjusted. As an example, some pharmacies had to build in more time for developing care plans for complex patients. One pharmacist explained,

We have really gotten more complex patients than what we were getting at the beginning [of NC-CPESN], people that are on 12 to 15 medicines. When we started to evaluate our process and workflow, we realized we needed to set aside more time for these patients.

Implementation Stage: Low-Performing Pharmacies

Restructuring.—Low-performing pharmacies used many of the same planning strategies as high-performing pharmacies but executed them differently. For example, when developing an implementation blueprint, low-performing pharmacies included details on how to deliver medication services, but unlike high performers, did not include a documentation procedure. As a result, services were inadequately documented for reimbursement requirements. Low-performing pharmacies were less likely to use planning strategies such as piloting medication management services, which caused problems with implementation (e.g., mismatch between the number of patients and staffing capacity). Additionally, low-performing pharmacies failed to designate implementation leaders—resulting in confusion about who was responsible for implementation.

Low-performing pharmacies experienced challenges with education (e.g., training personnel) and restructuring (e.g., redefining professional roles) strategies. They described either failing to train personnel prior to implementation or including insufficient detail in staff training. One pharmacy technician said, “I was just thrown in the water, sink or swim, with very little training. I did a lot of it incorrectly and wasted a lot of time and became very frustrated.” Similarly, low-performing pharmacies reported either failing to redefine professional roles or redefining professional roles in a way that hindered implementation. For example, some pharmacies designated only one pharmacist to be responsible for NC-CPESN, resulting in burnout for some staff members.

Redefining.—Low-performing pharmacies used some of the planning and finance strategies as high-performing pharmacies (e.g., tailoring intervention to patients' needs, reducing patient fees); however, they failed to develop relationships with PCPs, care managers, and patients. Some low-performing pharmacies introduced medication management services without first building relationships with individual patients, causing patient resistance. Others introduced too many services to a patient at a time—causing the patient to become overwhelmed and resistant to enrolling in new services. Similarly, participants described trying to request patient health information from providers without first building a relationship, resulting in resistance from the provider to share patient information. Low-performing pharmacies also described failing to reach out to care managers: “We haven't really worked with them [care managers]. It would probably be beneficial but in the day-to-day we barely have a minute to step away from the counter.”

Clarifying.—Similar to high-performing pharmacies, low-performing pharmacies used planning strategies to scale up implementation and education strategies to introduce medication management services. Where high and low performers differed was the use of restructuring and quality-management strategies. High-performing pharmacies described redefining professional roles to ensure pharmacists and pharmacy technicians were working at the top of their license. Low-performing pharmacies failed to use pharmacist and pharmacy technicians at the top of their license—causing inefficiency. Low-performing pharmacies also did not assess implementation quality or make adjustments to the process—resulting in continued poor-quality implementation. For example, one pharmacist stated: “We had a lot of enthusiasm at the beginning [of NC-CPESN] from everyone and then that sort of waned. Thinking back, we should have checked the temperature of things and maybe changed course to reenergize our staff.”

Sustainment Stage

Routinizing.—Although all pharmacies reached the implementation stage, a smaller group (all high-performing, $n = 18$) of pharmacies had reached a sustainment stage. These pharmacies discussed planning strategies such as obtaining formal commitments and developing resource-sharing agreements with PCPs (e.g., collaborative practice agreements, gaining electronic health record [EHR] access). Pharmacies also integrated medication management services into personnel policies (e.g., hiring and performance evaluation processes and new staff orientation) and created incentives for employee participation in NC-CPESN. Pharmacies that were part of a larger organization (e.g., multiple-independent pharmacies) used quality-management strategies such as creating centralized support systems, for example, hiring centralized pharmacists to assist local pharmacies with recruiting patients for medication management services.

Discussion

We interviewed representatives from 40 community pharmacies that were implementing NC-CPESN, a complex Medicaid population health management intervention, to compare implementation strategies of high- and low-performing pharmacies within stages of implementation. Similar to other complex innovations, NC-CPESN implementation required

multiple implementation strategies (e.g., plan, educate, restructure, quality management, finance) to support the implementation process (Magnabosco, 2006; Powell et al., 2012; Powell et al., 2015). Different strategies were needed at different stages of implementation and some strategies were repeated and refined throughout the implementation process. Findings also revealed differences in implementation strategies between high- and low-performing pharmacies. We are aware of no previous studies that have identified and compared implementation strategies employed in community pharmacy programs. A similar study was conducted in primary care but did not track strategies across different stages of implementation (Hysong, Best, & Pugh, 2007).

Participants used a variety of implementation strategies to support community pharmacy medication management services. For example, pharmacies used education strategies to increase patients' awareness of community pharmacy services, but continued to encounter resistance from some patients—a finding consistent with other studies (Law, Okamoto, & Brock, 2009; Oladapo & Rascati, 2012; Snyder et al., 2015). Future studies could examine population-level, education strategies (e.g., media campaigns) on awareness and acceptability of community pharmacy services by patients. Participants also used individual-level education strategies to educate providers on the role of community pharmacists in patient care. Future studies could test population-level strategies to educate providers, such as interprofessional education programs that explicitly focus on the clinical roles of community pharmacists. Similar to other medication management interventions (Benavides & Rambaran, 2013; Myers, 2011; Schultz et al., 2016), pharmacies used restructuring strategies, including redefining the professional roles of pharmacy personnel. Past studies have shown that, with training, pharmacy technicians can support medication management activities by gathering patient information and documenting medication histories (Buck, Gronkjaer, Duckert, Rosholm, & Aagaard, 2013; Cooper, Lilliston, Brooks, & Swords, 2014; Sen, Siemianowski, Murphy, & McAllister, 2014). Future studies should test the effectiveness of restructuring strategies that delegate components of population health management interventions to nonpharmacist personnel.

Although high- and low-performing pharmacies utilized many of the same strategies, their approach varied, which may have led to differences in implementation outcomes (e.g., participants from low-performing sites described problems with acceptability among personnel) (E. Proctor et al., 2011). To better understand variation in implementation, future studies could document a small set of implementation strategies in greater detail using existing guidelines and compare how the implementation strategies are employed across high- and low-performing pharmacies (Bunger et al., 2017; E. K. Proctor et al., 2013). We also found that low-performing pharmacies omitted certain implementation strategies used by high-performing pharmacies (e.g., assessing whether pharmacy has need for innovation, gaining buy-in from staff prior to implementation) and were less likely to progress to later stages of implementation (i.e., routinizing stage), suggesting that some strategies may have a bigger impact on sustainability. Determining early on whether the innovation is a good match for the organization is critical for sustainability (Wiltsey Stirman et al., 2012) but often gets neglected in implementation research (Aarons et al., 2011; Wisdom, Chor, Hoagwood, & Horwitz, 2014). Future studies could tailor existing tools for tracking implementation progress, such as the Stages of Implementation Completion measure

(Chamberlain et al., 2011; Saldana, Chamberlain, Wang, & Hendricks Brown, 2012), to community pharmacy settings and examine whether achieving specific implementation milestones impact program performance and sustainability.

This study had several limitations. First, we used a qualitative approach to assigning community pharmacies to different implementation stages based on self-reported data. Future studies could develop more objective measures to assign community pharmacies to different implementation stages for medication management interventions (Chamberlain et al., 2011; Saldana et al., 2012). Second, our study examined implementation strategies employed by the pharmacies (e.g., delivery system) and not other actors involved in implementation such as CCNC (e.g., support system) (Leeman, Birken, Powell, Rohweder, & Shea, 2017). Future studies could examine the implementation strategies used by support systems. Third, because our aim was to capture the breadth of implementation strategies, our study did not document implementation strategies in sufficient depth for replication (E. K. Proctor et al., 2013). Finally, we observed some differences between high- and low-performers that could explain the study results. For example, low-performers had a higher percentage of new staff than high-performers and were more likely to enroll in the program during the first year of the program. It is possible that pharmacies that enrolled in the second or third year of the program received better technical assistance from NC-CPEPN than pharmacies that joined in the first year of the program, which could explain better use of implementation strategies among high performers and greater likelihood of reaching sustainment. Future studies should explore how implementation assistance evolves over time and whether that contributes to improved implementation.

Community pharmacies nationwide are increasingly delivering medication management services under alternative payment models seeking to improve population health. In the process, these models may redefine how community pharmacies collaborate with other health care providers and patients. As the health care system moves toward greater collaboration across otherwise disparate providers, complex innovations that require simultaneous changes to many facets within and across health care organizations will become more common. This study contributes to the understanding of complex innovation implementation by identifying and comparing the implementation strategies used by high- and low-performing community pharmacies throughout a population health management intervention.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Community Pharmacy Staff and Site Characteristics.

Staff and site characteristics	Total (<i>n</i> = 40), % or <i>M</i> (<i>SD</i>)	High performers (<i>n</i> = 24), % or <i>M</i> (<i>SD</i>)	Low performers (<i>n</i> = 16), % or <i>M</i> (<i>SD</i>)
Staff role			
Pharmacy owner and pharmacist	20.0	20.8	18.8
Pharmacy manager and pharmacist	17.5	20.8	12.5
Pharmacist	47.5	41.7	56.2
Pharmacy technician	15.0	16.7	12.5
Staff Tenure			
0 to 3 years	32.5	29.2	37.5
4 to 5 years	45.0	41.6	50.0
6 years or more	22.5	29.2	12.5
Staff role			
Single independent pharmacy	20.0	25.0	12.5
Multiple independent pharmacy	50.0	37.5	68.8
Chain pharmacy	10.0	12.5	6.2
Outpatient pharmacy (e.g., FQHC)	20.0	25.0	12.5
Staff role			
Year 1	37.5	29.2	50.0
Year 2	32.5	25.0	43.8
Year 3	30.0	45.8	6.2
Pharmacy performance score		8.9 (2.1)	3.1 (1.8)

Note. *M* = mean; *SD* = standard deviation; FQHC = federally qualified health center.