

## RESEARCH ARTICLES

# Impact of a Diabetes Certificate Program on Pharmacists' Diabetes Care Activities

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**Objectives.** The objective of this study was to evaluate the effects that skills development and education acquired during a diabetes certificate program had on pharmacists' delivery of diabetes care.

**Methods.** To evaluate the program's effect, a survey was administered as a pretest to a group of pharmacists (N=30) beginning the program. In addition, the survey was administered to all pharmacists completing the certificate program in the last four years (N=126). Survey questions focused on the provision of services, patient contact, and reimbursement.

**Results.** Pharmacists who completed the program reported higher rates of providing consistent blood glucose management, nutrition education, and patient goal setting. In addition, a higher percentage reported documenting and billing for diabetic-related services.

**Conclusion.** The diabetes certificate program in this study had a positive impact on pharmacists' provision of diabetes care services to patients.

**Keywords:** diabetes, diabetes care, certification

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## INTRODUCTION

Diabetes is emerging as a disease of epidemic magnitude, nationally and globally, with regard to its prevalence, complications, and costs. The Centers for Disease Control and Prevention estimates that diabetes currently affects 17 million people or 6.2% of the United States population.<sup>1</sup> In those over 65 years of age, the prevalence is 7 million or 20.1%. Because the number of patients diagnosed with diabetes is increasing, the incidence of complications and costs associated with the disease are rising as well. The macrovascular complications, including heart disease, stroke, and high blood pressure, all occur at a rate 2 to 4 times more frequently in diabetic patients than in patients without diabetes. According to the American Diabetes Association, direct medical costs are \$44 billion annually, with an additional \$54 billion in indirect costs, including disability, work loss, and premature mortality.<sup>2</sup>

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Due to the nature of the disease, patients need a team approach that involves multiple health care professionals. Given the patient-specific pharmacotherapeutic regimens required to treat diabetes and the comorbid conditions that frequently exist, pharmacists can play a key role in the management of disease in these patients.<sup>3</sup> Health professionals who practice in the community setting have frequent contact with patients, resulting in many opportunities to help improve clinical outcomes.

Pharmacists, however, may not feel that they have the knowledge or the skills needed to provide this level of care.<sup>4,5</sup> In a recent survey, few pharmacists in Arizona reported providing intermediate or advanced diabetes patient education. The authors suggested that pharmacists feel that they need additional training to provide this type of care to patients. Furthermore, these authors recommended that specialized training can be "provided through continuing education programs... and diabetes education certification."<sup>5</sup>

Due to the increased incidence of diabetes and feelings that additional diabetes skills and credentialing are needed, pharmacists often seek to improve their knowledge base and skill set in diabetes care. A variety of options currently exist for pharmacists to gain this

education and recognition for advanced diabetes preparation:

- Certified Diabetes Educator (CDE). This credential is designed for those health care practitioners who have primary roles as diabetes educators. It is administered through the National Certification Board for Diabetes Educators (NCBDE) and is available to a variety of health care practitioners. Prior to taking the examination, requirements must be met including a minimum of 2 years of professional practice experience, 1000 hours of diabetes self-management education experience, and current employment as a diabetes educator for a minimum of 4 hours per week.<sup>6</sup>
- Board Certified - Advanced Diabetes Manager (BC-ADM). This certification is administered through the American Nurses Credentialing Center (ANCC) and is available to nurses, pharmacists, and dietitians holding advanced degrees. This credential differs from the CDE in that it is "more expansive, encompassing not only patient education, but also a broader patient care role, clinical management, and other professional/leadership activities." To attain this, practitioners must complete 500 hours of advanced practice and pass the examination.<sup>3</sup>
- Certified Diabetes Manager (CDM). Comprised of an examination sponsored and developed by the National Association of Boards of Pharmacy (NABP) and administered by the Standards in Pharmacy Credentialing (NISPC), this credential is only offered to pharmacists. The CDM does not have any practice requirements.<sup>7</sup>
- Certificate programs. These continuing education programs are offered to pharmacists by various organizations and colleges of pharmacy. These programs provide an educational foundation for diabetes care, as well as preparation to earn one of the above listed credentials.

The primary purpose of certificate programs is to provide "structured, systematic postgraduate educational and training experiences for pharmacists that are generally smaller in magnitude and shorter in time than degree programs, and that impart knowledge, skills, attitudes, and performance behaviors designed to meet specific pharmacy objectives."<sup>8</sup> After completing a diabetes certificate program, pharmacists should be motivated to provide more diabetes disease management programs and services to their patients. However, a review of the literature shows that only a few studies

have documented the outcomes of diabetes certificate programs or have described the added diabetes care services these pharmacists provide.<sup>9</sup>

One of the few studies involving pharmacists in a certificate program evaluated the effects that the program had on improving the knowledge and confidence levels of the participants. A pretest and posttest were administered to pharmacist participants in a diabetes certificate program to determine the changes in the pharmacists' confidence levels in providing diabetes patient care. Participants showed statistically significant improvements in cognitive test scores, with a mean pretest score of 49.6% and a mean posttest score of 68.6%. The attitudinal measures, which required the participant to rank their confidence level in providing certain services, also significantly improved from pretest to posttest scores.<sup>9</sup> The authors advocated but did not study the effects of such a program on patient care services.

The benefits of diabetes education for nursing and dietetic health professionals also have been determined.<sup>10,11</sup> In 1992, Mcleod and Benoit published an overview of the Canadian Diabetes Educator Certification program. When certified educators were asked to list any changes that they had noticed since becoming certified, 40% noted an increase in physician referrals, and 38% indicated that clients recognized their contribution and were pleased.<sup>10</sup> In another study, members of the Metropolitan New York Chapter of the American Association of Diabetes Educators were asked to indicate which roles they frequently or always performed in diabetes care. Nurses commonly taught foot care, general diabetes information, and diabetes emergency information. They also taught patients with diabetes how to adjust insulin dosages and they followed up on abnormal lab test results.<sup>11</sup> Although both of these studies were helpful in determining some of the outcomes of certificate and educational programs, they were conducted in the nursing and dietetic professions.

Although little has been published regarding specific diabetes certificate programs for pharmacists, studies have been completed on the provision of diabetes care by CDEs. Lyman et al compared pharmacists who were CDEs to pharmacists who were non-certified members of the American Association of Diabetes Educators (AADE).<sup>12</sup> The authors developed a 71-item survey to determine the provision of diabetes services, as well as the extent of billing and reimbursement for these services. Pharmacists who were CDEs completed more frequent documentation, provided more "specialty" services, conducted longer patient visits, had a larger number of patient visits, and spent a larger por-

tion of their time on diabetes education compared with pharmacists without a CDE. However, there was no difference found in the rates at which they charged for these services or in the development of patient skills in using a blood glucose monitor.<sup>12</sup>

In a recent study, pharmacist CDEs were surveyed to determine their demographic background, training, and professional affiliations, as well as the types of diabetes education services that they provide. Of the 415 pharmacist CDEs in the United States, 233 of them responded. Of these respondents, 81 practiced in an independent or retail pharmacy. Results from all respondents indicated that most of the diabetes care was provided to adult and geriatric patients. The majority of respondents regularly provided drug counseling and education on the disease process, meter use, insulin injections, and foot care. In addition, about half (50.4%) of the pharmacists counseled their patients on nutrition.<sup>13</sup>

Unlike earlier studies, the purpose of this study was to evaluate the effects of a specific diabetes certificate program on patient care services provided by pharmacists. Pharmacists in this certificate program were not just taught how to provide diabetes care services in their pharmacy practice sites, but also required to complete assignments based on their practice settings and diabetes patient populations. Although the pharmacists were assessed on the knowledge and skills gained from the certificate program, the impact the program had on their practice had yet to be determined.

## **METHODS**

### **Description of Program**

A diabetes certificate program, entitled "Developing Skills for Diabetes Care," was offered to community pharmacists who were interested in extending their practice by developing their knowledge of principles and learning theories to manage patients with diabetes. The program consisted of 1-day sessions held each month for 4 consecutive months and was developed and team-taught by Drake University faculty members. The faculty developed each module considering educational aspects covered in other certificate programs offered by pharmacy programs at the University of Tennessee<sup>14</sup> and Purdue University.<sup>15</sup> In addition, a variety of active learning components and activities were included in the program to assist participants with the implementation of services. These experiences included managing patients from the pharmacy where the pharmacist was employed, living the life of a patient with diabetes, using blood glucose meters in hands-on workshops, educating another individual on blood glu-

cose monitor testing and insulin administration, and completing a business/marketing implementation plan. See Table 1 for a complete list of topics and learning activities incorporated into the program.

The goals of this certificate program were to increase participants' knowledge regarding the pathophysiology, complications, treatment, and monitoring of diabetes. Knowledge pharmacists gained from the program could be incorporated into their practice through the provision of counseling, monitoring, cooperating with other health care professionals, documenting interventions, and evaluating outcomes. In addition, it was the hope of the program's faculty members that this preparation would allow the participants to sit for the CDM examination offered by NISPC and eventually earn credentialing as a CDE. However, the implementation of diabetes care services into practice sites was the ultimate goal of the certificate program.

### **Survey Procedures**

The survey instrument consisted of 71 questions developed by Lyman et al that pertained to the pharmacy practice site, services provided, patient recruitment, patient contact, reimbursement, and demographic information.<sup>12</sup> Four questions specific to the certificate program also were included in the survey. For the purpose of this assessment, 4 main areas were evaluated: (1) whether the pharmacists provided diabetes care services to their patients; (2) the types of diabetes services the pharmacists provided to their patients; (3) whether the pharmacists documented their diabetes services activities; and (4) whether they billed for the services they provided to their patients with diabetes.

The survey instrument was mailed in March 2001 to all pharmacists who had completed the certificate program from 1996 through 2000 (N=126). A cover letter explaining the rationale for the project, as well as a self-addressed, stamped return envelope was enclosed. A follow-up survey was sent in April 2001 to increase the response rate. In addition, this survey was administered to 30 participants as a pretest prior to earning their diabetes certificate in 2000 with the intent of comparing their pre and postsurvey responses.

### **Analysis**

Descriptive statistics are reported to describe the demographic background, type of care pharmacists provide to patients with diabetes, and the documentation of and billing for services. Using SPSS, chi-square analysis was performed to determine differences between the pretest 2000 certificate group and the posttest respondents. When cell size was not adequate for

Table 1: Certificate Program Topics and Learning Activities

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Topics
Session 1
ADA Guidelines in the Management of Diabetes/Teaching and Learning Principles (1 hour)
Pathophysiology of Diabetes Mellitus (1 hour)
Psychosocial Aspects of Care for Patient with Diabetes (1 hour)
Therapeutic Principles (2 hours)
Documentation of Services (1 hour)
Session 2
Exercise and Foot Care (0.5 hour)
Principles of Nutrition for Patient with Diabetes (2 hours)
Pattern Management (1 hour)
Monitoring and Insulin Injections (1.5 hours)
Session 3
Pregnancy and Diabetes (0.5 hours)
Complications of Diabetes (1.5 hours)
Hypoglycemia (0.75 hours)
Travel Guidelines (0.5 hours)
Sick Day/Intercurrent Illness Guidelines (0.5 hours)
The Role of Herbals and Micronutrients in Diabetes (0.5 hours)
Marketing a Diabetes Care Program (1 hour)
Learning Activities
Reading assignments from Core Curriculum for Diabetes Educators, 3 <sup>rd</sup> Edition, American Association of Diabetes Educators
Monitor patients in practice setting using SOAP notes
Completion of "Living the Life" exercise
Development and presentation of marketing plan for practice setting
Blood glucose monitor training and explanation of assigned meter to peer group
Final assessment involving educating faculty member on how to draw up, mix, and administer insulin and use a blood glucose meter (randomly selected from a list of 7 meters)

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chi-square analysis, the Fisher exact test was performed. Participants in the 2000 offering of the certificate group were eliminated from this analysis if they completed the pretest and responded to the posttest mailing. A true pre-post comparison could not be made with the 2000 group due to a low response rate among recipients of the post-certificate mailing. An a priori level of significance was established at  $\alpha = 0.05$ .

## RESULTS

The response rate for the pretest was 100%, with all participants (N=30) in the 2000 offering of the certificate program completing the questionnaire. Of the 126 pharmacists who had completed the program from 1996 to 2000, 62 (49.2%) responded to the mailing. Selected demographic characteristics of the respondents in both groups are reported in Table 2.

Demographics were similar between the pretest and posttest respondents with regard to age in years (36.3, 38.9, respectively), years since graduation (14.0, 14.2, respectively), hours worked per week (40.8,

41.8), female gender (69%, 65%, respectively), and BS degree (90%, 88.7%, respectively). A significant difference existed in the hours devoted to diabetes care activities each week, with 1.9 hours spent by the pretest respondents and 5.7 hours spent by the posttest respondents.

Of the 62 posttest respondents, 59 answered the question regarding completion of the NISPC diabetes credentialing examination. Of the 59 who completed the survey, 50 (81.3%) reported taking the NISPC examination. Of those 50 who completed the examination, 45 (90%) passed and received the credential. When asked about becoming a CDE, 6 of 59 participants indicated that they had already obtained the credential. Another 9 pharmacists planned to pursue the certification.

The type of care provided, documentation of services, and billing by respondents who had completed the program are reported in Table 3. The majority of pharmacists (67.7%) were providing some type of dia-

Table 2: Demographic information of Pretest and Posttest Respondents\*

	Pretest Respondents		Posttest Respondents	
	N	Mean (SD)	N	Mean (SD)
Age (y)	29	36.3 (10.21)	59	38.9 (9.43)
Years since pharmacy school graduation	29	14.0 (10.55)	60	14.2 (9.57)
Hours worked/week	29	40.8 (7.94)	60	41.8 (5.43)
Hours devoted to diabetes care activities/week <sup>†</sup>	27	1.9 (2.23)	60	5.7 (9.31)

\* Participants (4) responding to both the pre and posttest surveys were eliminated from comparison analysis.

<sup>†</sup> Statistically significant  $P < 0.01$

Table 3: Diabetes Patient Care Provided by Pharmacists Completing the Certificate Program

Diabetes Patient Care	N	Yes (%)
Provision of diabetes care	62	67.74
Types of services provided		
Blood glucose monitoring	62	66.13
Blood glucose management	62	41.93
Dosage adjustments	62	12.90
Foot checks	62	9.38
Nutrition education	62	35.48
Patient goal setting	62	33.87
Documentation of services provided	42	35.71
Bill for reimbursement for services provided	42	19.04

Table 4: Comparison of Pretest and Posttest Respondents on Diabetes Patient Care Provided

	Pre (% Yes)	Post (% Yes)	$\chi^2$	P
	N=26	N=57		
Provision of diabetes care	42.30	66.67	3.74	0.053
Services provided				
Blood glucose monitoring	42.30	63.16	3.16	0.075
Blood glucose management	11.53	38.60	6.21	0.013
Dosage adjustments	3.85	14.03		0.261
Foot checks	7.69	10.52	0.17	0.685
Nutrition education	7.69	33.33	6.21	0.014
Patient goal setting	----	31.58	10.48	0.001
Documentation of services provided*	8.0	35.13	5.99	0.014
Bill for reimbursement for services provided <sup>†</sup>	----	21.62	6.44	0.011

\*Pre N=25, Post N=37

<sup>†</sup>Pre N=26, Post N=37

betes care to their patients after completing the program. Most frequently, they were training patients to use blood glucose monitors (66.1%), managing patient blood glucose levels (41.9%), providing nutritional education (35.5%), and assisting patients with setting disease management goals (35.7%). Pharmacists showed less initiative in helping patients make dosage adjustments to their diabetes medications (12.9%) and in providing foot checks (9.4%).

Forty-two pharmacists responded regarding their documentation of services and related billing. Ap-

proximately 35% of pharmacists were documenting the services that they provided to their patients; however, only 19% percent were billing third party payers or patients directly for the services provided.

To determine if the certificate program had an impact on services provided to patients with diabetes, the pretest respondents were compared to the posttest respondents as described earlier in this paper. Results of these comparisons are reported in Table 4. For all variables measured in the 4 areas assessed, pharmacists who had completed the program had numerically

higher indications of providing or performing these activities compared to pharmacists who had not begun the program. Not all comparisons demonstrated significant differences. From the analysis, statistically significant differences were seen between the 2 groups in their rates of providing blood glucose management ( $\chi^2=6.21$ ,  $P=0.013$ ), nutrition education ( $\chi^2=6.21$ ,  $P=0.014$ ), and patient goal setting ( $\chi^2=10.48$ ,  $P=0.001$ ). In addition to improvements in the types of services offered, pharmacists who had completed the program were devoting more of their time to diabetes care activities ( $t=2.70$ ,  $P=0.009$ ). Furthermore, the differences between the rates at which they documented ( $\chi^2=5.99$ ,  $P=0.014$ ) and billed for services ( $\chi^2=6.44$ ,  $P=0.011$ ) were statistically significant, with pharmacists who had completed the program more likely to perform these activities.

## DISCUSSION

The majority of pharmacists responding provided services for their patients with diabetes. Most frequently, they provided blood glucose monitoring and blood glucose management. In addition, over a third of the pharmacists were providing nutrition education and patient goal setting. When comparing the 2 groups, those who had completed the program were more likely to provide help to their patients on blood glucose management, nutrition, and goal setting. All of these topics were included in the certificate program. This finding is consistent with the expectation that certificate program completion will contribute positively to the provision of these types of services.<sup>9</sup>

Although there was a trend of more pharmacists providing blood glucose monitor training to their patients after completing the program, it was not statistically significant. In part, it appears that many pharmacists already provided this type of care prior to beginning the program. One explanation is that these pharmacists may have received training on blood glucose monitors previously, resulting in provision of this type of service prior to beginning the program.

Even though foot care was a topic included in the certificate program, very few pharmacists were providing this type of care (9.4%). A study completed by Shane-McWhorter et al indicated that 46.1% of the CDE pharmacist respondents regularly performed foot examinations.<sup>13</sup> In this study, there were no statistically significant differences in the rate at which they performed foot examinations between those beginning the program and those who had completed the program. Apparently, pharmacists who are also CDEs are more likely to provide this care; however, it is not known

how many of these respondents were community pharmacists.<sup>13</sup> One explanation for lack of foot care in this study could be that these pharmacists, who were primarily community pharmacists, felt that it was out of their realm of responsibility and that a podiatrist or physician should provide this type of care. In addition, the pharmacists in this program may not have the physical facilities or the time to perform foot examinations. More research is needed to determine the reason that these pharmacists were not providing this service.

However, these explanations do not hold true for the lack of dosage adjustments provided by the pharmacists (12.9%). Since Hepler and Strand coined the phrase "pharmaceutical care," the profession has been encouraging pharmacists to improve patient outcomes through drug therapy monitoring and management.<sup>16</sup> In general, pharmacists believe that helping patients in the proper use of medications is within the domain of pharmacy practice. From the results of this study, pharmacists are not taking an active role in managing medications in regards to diabetes care. Although physicians traditionally make decisions regarding dosage adjustments, pharmacists could collaborate with them in this type of care. Reluctance of pharmacists to cooperate with other health care professionals, in particular, with physicians, may be the issue. Unlike this study, a study of pharmacist CDEs showed that 52.9% of the respondents reported modifying their patients' drug therapy. Requirements for CDE designation requires other health care professionals to document the pharmacists' provision of patient care hours. Therefore, it is possible that these pharmacists were likely involved in a team of practitioners, including physicians.<sup>13</sup> Perhaps this allows more opportunities for the pharmacist to collaborate with other health care professionals.

If the issue is collaboration, practitioners may need to be taught how to work within this dynamic. Since most of the pharmacists in this program were community practitioners, they may have little experience in this type of collaborative care. This certificate program discusses the need for collaboration, but does not address how to develop collaborative relationships with other health care professionals or how to work within that environment. Certificate programs should include a component about contacting health care professionals and building collaborative relationships in a community setting.

As a part of the certificate program, pharmacists were encouraged to document patient information as well as the services provided to the patient. The program required pharmacists to complete a series of SOAP notes and discuss these notes with their peers

and instructors. When looking at the results of the survey, the certificate program appears to have had an impact on the rate at which pharmacists document the diabetes services they provided. In the group starting the program, only 8% of pharmacists were documenting their services, while 35% of those who had completed the program reported documenting their services. Although more pharmacists were documenting these services since completing the program, approximately two thirds still were not documenting the services provided to their patients.

Similarly, pharmacists who completed the program were more likely to bill for their services than those just beginning the program. None of the pharmacists in the pretest group were billing for their services, compared to 21% of pharmacists who completed the program. Although there was an increase in the number of pharmacists billing for their services, less than 25% of pharmacists were billing patients and/or insurance companies for their services. Like pharmacy practitioners in general, these pharmacists seemed reluctant to bill for the patient care services provided. Billing for services was not addressed in the certificate program so the pharmacists may not have felt that they had the ability or comfort level to bill patients and/or insurance companies.

In addition, these pharmacists face a barrier with the current legislation for billing Medicare in regards to diabetes care. With current legislation, CDE designation or being part of an ADA Recognized Program is required for obtaining reimbursement for diabetes care services. In most cases, it is unlikely that community pharmacists will have this credential, thereby limiting the ability of pharmacists to bill Medicare for the diabetes services they are providing. Pharmacists lack provider status under Medicare and are typically not recognized by other health care professionals or by billing services as medical providers. The majority of pharmacists who hold the CDE designation work in ambulatory care clinic settings where they are more easily able to complete the requirements to obtain this credential.<sup>13</sup>

Although the certificate program had a positive impact on pharmacists' provision of patient care, there is room for improvement. Pharmacists who had completed the certificate program documented services more frequently and spent more time on diabetes care activities, but not at the same level as pharmacists with the CDE designation, as seen in the Lyman et al and Shane-McWhorter et al studies.<sup>12,13</sup> In many cases, less than 50% of the pharmacists in this study were performing these activities. Questions arise as to why

some pharmacists were participating in diabetes pharmaceutical care at a higher level than other pharmacists and what barriers exist to prevent the provision of this type of care. Perhaps there is a need for diabetes educators to continue their relationships with pharmacists beyond completion of the program to act as a resource or motivator for them in their practice sites. Further investigation is warranted so that pharmacists' provision of diabetes patient care services can expand and advance.

### **Limitations**

Nearly half of the pharmacists who had completed the certificate program did not respond to the survey. One would expect that the pharmacists who are providing services would want to share what they are doing with others and, therefore, would be more likely to respond to a survey like this. If this is the case, it could be concluded that only a small percentage of pharmacists completing the program are providing services to diabetes patients. Alternatively, those pharmacists providing services may have felt too "busy" to complete a questionnaire, especially when one considers the length and complexity of the survey. The survey was several pages long and asked detailed information, which also may have contributed to the low response rate.

Besides the response rate, a true preprogram and postprogram comparison could not be made since pretested participants were not the same pharmacists who completed the posttest. Because of this, it was difficult to make individual comparisons. In addition, this program is not identical to other diabetes certificate programs. A comparison of topics with other programs indicates that there are several similarities, but no 2 diabetes certificate programs are the same. Nevertheless, this type of assessment should be done with other programs to determine the effect of diabetes certificate programs on pharmacists' practice of diabetes care.

Furthermore, participation in the certificate program may not be the sole cause for the improvement (or lack of improvement) in many of these diabetes care areas. Other factors may include time, additional education, employer support (or lack of support), space available for education, and workload issues. Further study is recommended to evaluate barriers that exist for the provision of diabetes care services by pharmacists.

### **CONCLUSIONS**

This certificate program had a positive impact on pharmacists' provision of diabetes care services. This assessment provided valuable feedback to the certificate program faculty. The authors recommend that

evaluation of certificate programs be performed to determine whether the goals and learning objectives are achieved. In addition, assessment of the program's effectiveness should include the impact of obtaining a certificate in diabetes education on a pharmacist's provision of patient care.

Although there were improvements, these pharmacists were not providing patient care at the level that their pharmacist CDE counterparts appeared to be providing. Even though pharmacists had advanced training in diabetes, few of them were providing the level of care possible in their practice settings. While the participants' tests scores and assessments indicated knowledge and skill development, some pharmacists had difficulty integrating these services into their practice. Because the profession of pharmacy is seeking to move to a pharmaceutical care model in community practice, it is important to determine why pharmacists who had completed a diabetes certificate program such as this one are still not providing these services to the level of a CDE pharmacist. Further research is needed to determine if these pharmacists need additional education and/or skill development, or if other barriers to the provision of these services exist.

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