

RESEARCH ARTICLES

A Five-State Continuing Professional Development Pilot Program for Practicing Pharmacists

Anna Legreid Dopp, PharmD,^a Jennifer R. Moulton, BSP Pharm,^b Michael J. Rouse, MPS, BPharm(Hons),^c and CoraLynn B. Trewet, PharmD, MS^d

^aUniversity of Wisconsin-Madison School of Pharmacy

^bIowa Pharmacy Association, The Collaborative Education Institute

^cAccreditation Council for Pharmacy Education

^dUniversity of Iowa College of Pharmacy

Submitted July 1, 2009; accepted August 22, 2009; published March 10, 2010.

Objective. To determine whether a structured educational intervention would support pharmacists' utilization of a continuing professional development (CPD) model compared to pharmacist control subjects.

Methods. A prospective, randomized, observational case-control study of CPD was conducted in which pharmacists participated in several educational interventions, and study and control groups completed prestudy and poststudy survey instruments.

Results. Survey data from 57 pharmacists (n = 28 study, n = 29 control) were analyzed and significant outcomes from the CPD stages of reflect, plan, act, evaluate, and record were found between matched study subjects and study and control group comparisons.

Conclusions. With appropriate training and support, pharmacists can utilize a CPD approach to their lifelong learning and professional development.

Keywords: continuing professional development, reflection, self-assessment, portfolio, continuing education

INTRODUCTION

Pharmacy practice in the United States is regulated by boards of pharmacy in the 50 states, the District of Columbia, Guam, and Puerto Rico. Requirements for initial licensure and maintenance of licensure differ to some extent, but all 53 boards require pharmacists to complete a defined number of hours of board-approved continuing education (CE) to maintain their license.¹ Similar regulatory approaches for continuing education apply in the majority of health professions.² Participation in CE activities provides a measure of assurance that practitioners are maintaining and updating their professional knowledge, and serves as a proxy for assuring ongoing competence to practice. Board of pharmacy requirements are summarized in annual surveys of pharmacy law published by the National Association of Boards of Pharmacy (NABP). The most common requirement is 15 hours (minimum) of CE per licensure year (47 of 53 boards); the range being 10 to 20 hours. Twenty-eight boards have additional requirements regarding format (eg, a minimum number of "live" hours of CE) or content (eg, pharmacy law). All

boards recognize educational activities offered by CE providers accredited by the Accreditation Council for Pharmacy Education (ACPE); some accept accredited continuing medical education (CME) or accredited continuing nursing education (CNE); and some have an evaluation process or criteria for board approval of CE activities.

State-mandated CE for pharmacists was first introduced in Florida (1965), although the idea was discussed in the early 1940s.³ In the mid-1970s, NABP adopted a resolution on mandatory CE for re-licensure, and the American Pharmaceutical Association-American Association of Colleges of Pharmacy (APhA-AACP) Task Force on Continuing Competence in Pharmacy (1972-74) concluded that CE was the best available mechanism for assuring pharmacists' ongoing proficiency.⁴ In 1974, the APhA Board of Trustees recommended that ACPE be requested to develop a system of accreditation for CE, and the following year ACPE introduced accreditation standards for CE providers. ACPE accredits providers of CE rather than individual CE activities. In subsequent years, as more states introduced mandatory CE requirements, the number of providers accredited by ACPE increased to approximately 400.

Corresponding Author: CoraLynn B. Trewet 1801 Hickman Road, Des Moines, IA 50314 Tel: 515-282-5630. Fax: 515-282-2332. Email: coralynn-trewet@uiowa.edu

Following the findings and conclusions of the 1972-1974 Task Force on Continuing Competence in Pharmacy, it was agreed that the purpose of CE for pharmacists and other health professionals was the improvement of patient care and health maintenance and the enrichment of health careers.⁵ It was stressed that CE structures being implemented at that time should be recognized as “transitional mechanisms to be used until means are developed to evaluate the competence of the individual pharmacist in the performance of his [sic] professional responsibilities.” Additionally: “It is this competence to perform, which will not be the same for each type of pharmaceutical practice, that eventually must be measured and evaluated.”⁴

For over 30 years, approaches to CE and assurance of competency for pharmacists have remained largely unchanged. The same is likely to be true in other health professions. While CE can be effective in both learning and practice change, there is a growing body of evidence (primarily from the CME literature) that CE can be more successful in these areas if the educational activities are: in an area of interest or preference; related to daily practice; selected in response to identified need; interactive, hands-on; use more than 1 intervention; continuing not opportunistic; self-directed (in content and context); focused on specific outcomes/objectives; use “reflection”; and include a commitment to change by the learner.⁶⁻⁸ Continuing education providers, practitioners, and regulators have not yet pervasively adopted such strategies, even though there have been calls for an overhaul of the continuing education of healthcare professionals.⁹ New ways to assure and enhance learning outcomes, increase application of learning in practice, and ultimately improve patient care are needed and being actively explored.

Continuing professional development (CPD) is one approach that has been implemented using a variety of models and regulatory frameworks in a variety of health professions and countries such as the United Kingdom (UK), Canada, and New Zealand. The need for CPD as a model to maintain professional competence in health professionals in the United States has been well documented.¹⁰⁻¹² The Chartered Institute of Personnel and Development (UK) states that CPD should be continuous, be the responsibility of the individual learner to own and manage, be driven by the learning needs and development of the individual, be evaluative rather than descriptive, and be an essential component of professional and personal life.¹³

Stimulated by developments and initiatives in other countries, in 2000, the profession began to explore and discuss different approaches and models, such as CPD, as strategies to enhance continuing education and its outcomes. Over the next several years, statements and policies

relating to CPD were adopted by a number of international, national, and state pharmacy organizations including the International Pharmaceutical Federation (2002), NABP and AACP (2003), ACPE (2003 and 2006), the American Society of Health-System Pharmacists (ASHP, 2004 and 2009), APhA (2005), and Joint Commission of Pharmacy Practitioners (JCPP, 2008).^{11,14-19} Early policies primarily advocated exploration of the concepts, while later policies encouraged the development of CPD tools and resources to support pharmacists in their learning and other steps toward implementation.

The CPD pilot program described in this paper defined CPD as a “self-directed, ongoing, systematic, and outcomes-focused approach to learning and professional development.” In its materials, the program used an updated version of the CPD cycle described by Rouse (Figure 1).¹² Changes to the original figure were made to depict the dynamic interplay that should exist between each of the sequential stages of the cycle and the CPD portfolio and to stress that the portfolio should be a dynamic resource to support learning and professional development, and not a static filing system.

Pilot programs or a phased roll-out have been undertaken in several countries, including the UK, New Zealand, and Canada.²⁰⁻²² In Canada, pharmacy is regulated at the provincial level, and while different regulatory models have been adopted, CPD principles were widely incorporated. In each of these examples, there was a regulatory mandate behind the implementation in addition to drivers for change within the profession. The 5-state pilot program, by contrast, was entirely a voluntary project spearheaded by professional associations and schools of pharmacy in the participating states. The 5-state CPD pharmacy pilot program was the first prospective, broad-based study to evaluate the potential role of CPD

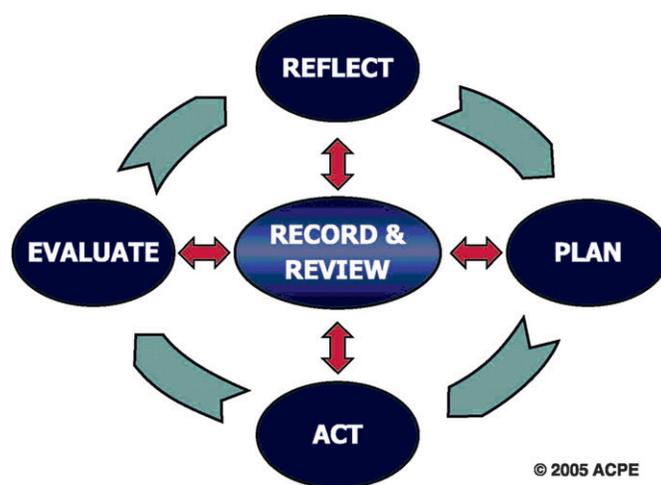


Figure 1. A continuing professional development cycle

for pharmacists in the United States. The primary purpose of the program was to stimulate a shift in the profession from “exploration” to “implementation”; however, a secondary objective was to conduct a formal study to evaluate the effectiveness and feasibility of a CPD approach for individual pharmacists.

METHODS

This was a prospective, randomized, observational case-control study to determine whether pharmacists who adopted a CPD approach (as demonstrated by participation in a structured certificate program to develop the knowledge and skills deemed necessary) were more or less likely to assess and identify their professional learning needs, develop and implement a personal learning plan, evaluate their learning outcomes, and document each of these elements compared to pharmacists who utilized a traditional approach to CE without a structured intervention.

Study Participants

Discussions for the initiation of a pharmacy CPD program began in March 2005 with leaders from state pharmacy associations, ACPE, NABP, and academia. Discussions and planning continued for a year until a CPD taskforce was created and its members, mission, and priorities were finalized. State associations and colleges and schools of pharmacy from the 5 participating states (Indiana, Iowa, North Carolina, Washington, and Wisconsin) were included in the taskforce along with 1 staff member each from ACPE and NABP. Each state received approval from its respective academic institutional review board before proceeding with the program. There were no exclusion criteria for this study; pharmacists from all practice settings and expertise were invited to participate. In July 2006, each participating state attempted to enroll 60 pharmacist subjects. Pharmacists were recruited through brochures developed by the taskforce, inviting them to participate. Mailing lists with pharmacist addresses were purchased through the respective state boards of pharmacy and databases of the state associations and colleges and schools of pharmacy. Pharmacists were advised in the recruitment materials that they would be randomly assigned into either a study group or control group; the target size for each group being 30 pharmacists.

Pharmacists were enrolled upon completion of an online baseline survey instrument and home-study CE program, CPD 101. The 71-question survey instrument assessed the pharmacists' habits and practices relating to CE practices, learning, and professional development. It was divided into sections titled “Identifying Your Learn-

ing Needs,” “Planning Your Learning,” “Participation in Learning Activities and Programs,” “Documentation of Learning and Professional Practice,” and “Evaluating the Impact/Outcomes of Learning” corresponding with the 5 components of the CPD cycle (Table 1). Participant responses (study and control group) to the baseline and subsequent surveys were anonymous. Participants were provided with instructions to generate their own reproducible identification codes, including a state identifier, so that pre- and post-study survey responses could be matched and evaluated. The home-study CPD 101 program provided information on the definition and components of CPD and the rationale for implementing a CPD model in the United States for practicing pharmacists. CPD 101 participants were required to listen to the content and complete a final evaluation with learning assessment questions. Assignments for the study and control groups were made in August 2006, after which pharmacists in the control group did not have any intervention or follow up from the taskforce until the end of the study when they were asked to complete the same online survey as previously described.

CPD Program Elements

In fall 2006, the study group began an ACPE-accredited certificate program with learning interventions equally spaced over the period of 1 year. A certificate program is a structured, systematic, postgraduate education and continuing education experience for pharmacists that is generally smaller in magnitude and shorter in duration than a degree program or residency training program. Certificate programs are designed to instill, expand, or enhance practice competencies through the systematic acquisition of specific knowledge, skills, attitudes, and performance behaviors. When ACPE implemented new accreditation standards for continuing pharmacy education (CPE) in January 2009, which incorporated standards for practice-based CE activities, the Certificate Program Standards were discontinued. Participants in the CPD certificate program could earn up to 19 hours of CE credit and acquire the knowledge and skills to initiate and maintain their own CPD. There were 5 elements that study participants were required to complete in the pilot program: (1) online baseline survey and CPD 101; (2) home study and self-assessment; (3) initial workshop; (4) two follow-up workshops; and (5) online postsurvey. The home-study and self-assessment portion of the program included completion of an online, self-assessment, reviewing 2 journal articles on CPD, and an evaluation with learning assessment questions. The self-assessment was composed of 39 clinical, competency-based questions. The live portion of the certificate program included 3

Table 1. Examples of Survey Questions Administered to Pharmacist Participants in a Continuing Professional Development Study

Section of Survey	Sample Questions
Identifying your Learning Needs (13 questions total)	<ul style="list-style-type: none"> ● Yes/No: During the past year, have you used any structured self-assessment tools related to your work or professional practice to help you identify your practice strengths and/or areas for improvement? ● Yes/No: During the past year, did you undertake any deliberate, careful consideration or appraisal of your work or professional practice primarily to identify learning needs or opportunities?
Planning your Learning (20 questions total)	<ul style="list-style-type: none"> ● Yes/No: During the past year, did you identify for yourself any specific learning or professional development objectives? ● Strongly Disagree-Strongly Agree: I am confident in my ability/skill to plan my learning and professional development.
Participation in Learning Activities and Programs (18 questions total)	<ul style="list-style-type: none"> ● Yes/No/Unsure: Have your CE habits/activities changed notably in the past year (e.g. program format such as live or home-study, subject matter content)? ● In addition to approved/accredited CE listed for which you received a statement of credit or similar formal documentation, how many additional hours of formal, structured CE do you estimate that you completed in the past year?
Documentation of Learning and Professional Practice (5 questions total)	<ul style="list-style-type: none"> ● Yes/No: Do you maintain any record of your professional practice activities? ● Other than statements of CE credit (or similar evidence of completion of a learning activity) how have you kept a record of your learning?
Evaluating the Impact / Outcomes of Learning (15 questions total)	<ul style="list-style-type: none"> ● Strongly Disagree-Strongly Agree/Undecided: The CE programs that I completed during the past year addressed a range of the competency areas that I needed to develop and maintain as a licensed pharmacist. ● Strongly Disagree-Strongly Agree: The current system of mandatory CE meets my lifelong learning needs as a licensed pharmacist.

workshops where pharmacists were given in-depth instruction on the 5 components of CPD: reflect; plan; act; evaluate; and record and review. The first workshop provided an overview of each of the CPD components and a discussion and survey of the pharmacists' learning styles using an instrument developed by Austin.²³ The second and third workshop went into greater detail on the components plan, act, evaluate, and record and review. Each intervention provided an opportunity to determine participant completion of documentation requirements and gain feedback from participants on the program. Those who completed the study portion of the program were asked to complete the same online survey instrument as provided during CPD 101, prior to randomization. A schematic of the process and timeline is provided in Figure 2.

Data Analysis

The sample size was chosen to create a pool of pharmacist volunteers covering the various geographical areas from the 5 states involved in this program. No statistical justification for the sample size was performed. The limited number of comparable studies in this area made it

difficult to estimate the amount of variance observed in the primary variables of interest. Because this was a unique study design, the statistical power was determined after the study was completed, based on the data collected from the instruments that had been developed specifically for this program. Likert-scale questions were analyzed using primarily descriptive statistics; however, appropriate paired analysis was performed by nonparametric statistical techniques including Fisher exact, chi-square, and Wilcoxon signed rank sum tests.

RESULTS

Two hundred fifty-one pharmacists were enrolled and completed the baseline prestudy survey instrument and 232 completed the home-study CPD 101. The 232 pharmacists were randomly assigned into either the study group (n=127) or the control group (n=105) (Figure 2). After a year, these numbers were drastically reduced due to attrition (38.6% of the loss) and incomplete survey requirements (61.4% of the loss). The final analysis included 28 study subjects and 29 control subjects who had completed all 5 of the study components. The demographics of the 2 groups did not differ significantly (Table 2).

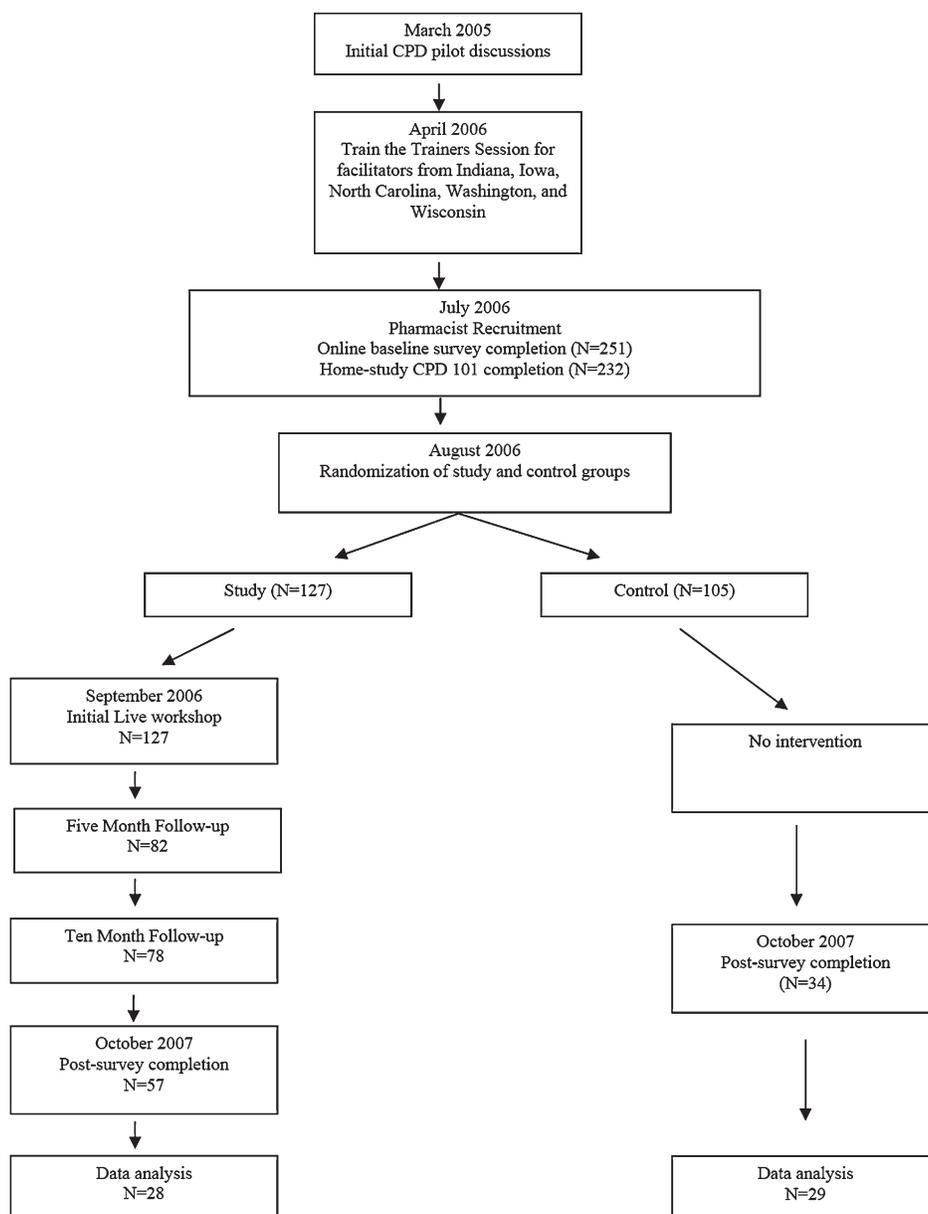


Figure 2. The CPD pilot process and timeline

The results of the prestudy and poststudy surveys are reported below; they are presented in accordance with the 5 CPD components: reflect, plan, act, evaluate, and record and review. Comparison groups include participants' pre-study vs. poststudy responses, and study group vs. control group poststudy responses (Table 3).

There were no significant differences between the comparison groups when study (ie, those who successfully completed all aspects of the CPD certificate program) and control subjects were asked to rank their level of agreement with the following statement: "I am confident in my ability/skill to identify my learning needs related to work or professional practice" (prestudy re-

sponses vs. poststudy responses, $p = 0.22$; study group vs. control group poststudy responses, $p = 0.49$). However, pharmacists in the study group were more likely to use a structured self-assessment tool to help identify practice strengths and areas for improvement compared to pharmacists in the control group ($p < 0.01$). After completion of the study, pharmacists enrolled in the study group were also more likely to undertake deliberate, careful consideration or appraisal of their work and professional practice primarily to identify learning needs or opportunities ($p < 0.01$).

Pharmacists in both comparison groups felt confident in their ability to plan their learning and professional

Table 2. Baseline Characteristics of Subjects Enrolled in a Study of Continuing Professional Development Among Pharmacists

Characteristic	Study (N=28)	Control (N=29)	P
State Participation			
Indiana	0	0	1.00
Iowa	8	8	1.00
North Carolina	16	10	0.35
Washington	3	4	1.00
Wisconsin	1	7	0.07
Gender			
Men	3	6	0.48
Women	25	23	0.85
Education			
BS	6	14	0.19
Pharm.D.	14	10	0.48
Both	8	4	0.35
Years in Practice			
27 to 36	3	5	0.72
17 to 26	9	10	1.00
7 to 16	7	7	1.00
0 to 6	9	7	0.79
Post Graduate Training			
Residency and/or Fellowship	12	11	1.00
Board Certification	4	3	1.00
Current Title			
Director/Manager/Owner	7	6	1.00
Staff	20	23	0.84
Relief	1	0	1.00
Practice Setting			
Academia	1	5	0.21
Community Practice ^a	6	8	0.77
Hospital/Health System ^b	20	13	0.38
Other ^c	1	3	0.61
Patient Care Delivery			
Direct Patient Care	22	25	0.85
No Patient Care	6	4	0.73
Number of Practice Settings in Career			
1-3	20	20	1.00
4+	8	9	1.00

^a Community Practice: Chain or independent pharmacy, Outpatient, or Correctional

^b Hospital/Health System: Hospital, Anticoagulation, Ambulatory, or Specialty Clinic

^c Other: Health Maintenance Organization, Home Health, Industry, or Long Term Care

development (difference was not significant). Pharmacists in the study group were more likely to identify and develop specific, measurable, achievable, relevant, and time sensitive (SMART) learning or professional development objectives compared to control subjects ($p < 0.01$). At the completion of the study, 96.4% of the study subjects identified learning objectives and 92.6% developed a formal

learning plan that included proposed timelines and activities to achieve them. This was significantly different compared to prestudy responses ($p < 0.01$) and compared to the control group ($p < 0.01$). After completion of the program, study subjects were more likely than control subjects to select a CE activity that would help them achieve a pre-specified learning objective ($p < 0.01$).

Pharmacists in the study group felt that they had changed their CE habits and activities notably in the past year ($p < 0.01$). Examples of the changes included new preferences in selecting CE formats and subject matter. There were no significant differences in participants' preference for choosing to participate in CE activities. For example, pharmacists from both comparison groups were likely to participate in a CE activity because of a patient-related issue, work-related issue, new service, new project, or new research protocol. Pharmacists in the study group reported that in addition to their respective state board of pharmacy CE requirements, they completed additional formal, structured CE throughout the CPD program ($p = 0.01$). The additional hours reported ranged from 1 to more than 20.

When compared with baseline, study participants gained more confidence in their ability to evaluate the impact and outcomes of their learning ($p = 0.01$). Pharmacists in the study group were more likely to review and reconsider their learning objectives and personal learning plan after some period of time compared to prestudy ($p < 0.01$) and control subjects poststudy ($p < 0.01$). There were no significant differences between comparison groups on careful reflection after participating in a CE activity and making a conscious commitment to do something as a result of their learning.

Those participants randomized to the study group were more likely to maintain a record of their professional practice activities than the control group participants ($p < 0.01$). Study group pharmacists were also more likely to document the deliberate consideration of learning needs and their learning plan than they were prior to the study ($p < 0.01$) and compared with control subjects ($p < 0.01$). At the completion of the CPD program, study subjects were more likely than control subjects to review their CPD portfolio and identify new learning needs and opportunities ($p < 0.01$).

Overall, pharmacists in the study group were more likely to feel that over the past year, participation in CE activities enhanced their professional knowledge to a larger extent than the control group ($p < 0.01$). Interestingly, over 70% of all survey respondents disagreed or strongly disagreed with the statement that the current CE system was able to meet their personal or professional lifelong learning needs.

Table 3. Summary of CPD Pilot Prestudy and Poststudy Survey Responses of Study and Control Subjects

Survey Question	Prestudy vs. Poststudy Responses (n=28)	Study Group (n=28) vs. Control Group Poststudy Responses (n=29)
Reflect Component		
Strongly Disagree – Strongly Agree. I am confident in my ability/skill to identify my learning needs related to my work or professional practice	0.22	0.49
Yes/No. During the past year, have you used any structured self-assessment tools related to your work or professional practice to help you identify your practice strengths and/or areas for improvement?	<0.01	<0.01
Yes/No. During the past year, did you undertake any deliberate, careful consideration or appraisal of your work or professional practice primarily to identify learning needs or opportunities?	<0.01	<0.01
Plan Component		
Strongly Disagree – Strongly Agree. I am confident in my ability/skill to plan my learning and professional development	0.16	0.19
Yes/No. During the past year, did you identify for yourself any specific learning or professional development objectives?	<0.01	<0.01
Never-Always. With respect to frequency in selecting a CE activity: The program would help me achieve a specific learning objective; attending such a program was in my learning plan.	0.07	<0.01
Act Component		
Yes/No. Have your CE habits / activities changed notably in the past year?	<0.01	<0.01
0 Hours - > 20 Hours. In addition to the approved/accredited CE listed for which you received a statement of credit, how many additional hours of formal, structured CE do you estimate you completed in the past year?	0.01	0.08
Evaluate Component		
Strongly Disagree-Strongly Agree. I am confident in my ability/skill to evaluate the impact or outcomes of my learning	0.01	0.19
Yes/No. Did you formally review/reconsider your learning objectives or learning plan after some period of time after identifying them?	<0.01	<0.01
Never-Always. For the CE programs that you completed, how often did you carefully reflected on what was learned?	0.19	0.067
Never-Always. For the CE programs that you completed, how often did you make a conscious commitment to do something as a result of your learning?	0.13	0.64
Record & Review Component		
Yes/No. Did you maintain a record of your professional practice activities?	0.01	<0.01
Yes/No. As a result of reviewing the documentation that you kept, did you identify any learning needs or opportunities?	<0.01	<0.01

DISCUSSION

This was the first prospective, randomized control trial examining the effectiveness of an educational intervention to introduce CPD as a structured approach to learning and professional development for pharmacists in the United States. In order to promote CPD as a feasible structured lifelong learning model, an intensive educational approach will be needed not only to introduce the concept of CPD to pharmacist learners but to support their progression through the continuous cycle.

When discussing the reflection portion of the cycle, a structured self-assessment tool was provided and was the basis for the program so we expected to see a significant difference compared to the control group. Deliberate consideration of professional practice was significantly different from baseline in the study group, showing participants factored work needs alongside their professional interests. The lack of a significant increase in confidence in ability to identify learning needs may have been due to differences in perception of learning needs between members of the

study group, who received specific education in this area, and the control group. It was surprising to see this did not change from baseline in the study group; however, we believe selection bias of the participants recruited in this study may have influenced this and other findings.

At baseline both groups felt confident in planning their learning, but the study participants utilized SMART objectives and developed a more structured learning plan with specific timeline and outcomes in mind, selecting activities that helped them meet these objectives rather than selecting the most convenient activities or an activity based on interest alone.

We would expect study participants to change CE habits during the study period, although it was a positive finding to see the participants gain confidence in their ability to evaluate the impact and outcomes of learning compared to baseline. An essential component to the CPD cycle is evaluation. Participants were more likely to revisit their learning objectives and personal plan at the end of the study, most likely due to the establishment of learning objectives and structure the program provided.

Several reasons may account for the positive results with the record/review portion of the cycle. The study group was given materials and resources to assist in this, whereas the control group was merely instructed to complete without a structured system to log their activities. The structured records kept by the study group probably aided in their deliberate consideration of learning needs and plan more so than a simple log would have. More importantly, study participants used their CPD portfolio to identify new learning needs, thus completing/restarting the CPD cycle.

There were some cases where statistical significance was seen when comparing prestudy and poststudy data within the study group, but not when comparing the study group and the control group. An example of this was the responses to the survey question assessing confidence in study and control participants' ability to evaluate the impact and outcomes of learning. Those in the study group were significantly more likely to agree with that statement after the pilot program, but there was no difference between responses of the study group and control group in the poststudy. The difference may lie how the 2 groups understood the measurement of outcomes and approached the evaluation process.

Participants in this pilot program reported the CPD process provided them with "permission" to seek out multiple educational opportunities that represented their own professional interests and needs, but were possibly not structured as traditional continuing pharmacy education. One participant in particular had considered attendance at an enteral nutrition conference for nearly 6 years,

but did not attend because she felt it could not be justified if she did not receive ACPE credit towards relicensure. After the CPD session, she decided to attend the conference and stated it was "the best education I have received for what I do on a daily basis."

Other comments were similar: "I am now aware that I need to pursue my own interests, in addition to required CE, whether it meets CE requirements or not." "It helped me get organized and thinking about what I need to learn instead of just taking a CE because it's available." "[CPD provides an opportunity to] create goals that are both educational (drug-topic review, such as going to a CE program) AND professional (starting a monthly screening program or updating my resume/create a CV). It's nice to know that we can grow in both ways and it will all be seen as CPD." In addition, participants were appreciative of the opportunity to discover/identify their own personal learning style, and the importance of matching the learning opportunities to their style in order to maximize knowledge transfer.

Participants expressed some frustrations about the CPD process as well, mostly related to documentation associated with the CPD portfolio, and stated that it needs to be concise and manageable over time. Similar concerns have been expressed by pharmacists in other countries where CPD has been implemented.²⁴ Given that the CPD portfolio provides important documented evidence of a pharmacist's effective adoption of a CPD approach, ensuring that the portfolio is a tool supporting learning rather than a burden and barrier to learning may present a challenge for CPD advocates and regulators. Participants also expressed concern about the system of mandatory CE and the incentive for pharmacists to participate in this process.

Cox and Stein described the need for identification of learning needs more than 25 years ago.^{25,26} Currently there are no reports studying the outcomes of CPE, such as changes in practice leading to improved patient outcomes; however, parallels can be drawn from past research in CME. A critical review of CME in the United States by Manning concluded that conventional, formal CE, unless focused on specific behavioral objectives, does not alter a physician's practice measurably.²⁷ Our study utilized specific behavioral objectives and a commitment to change. Nona and colleagues also summarized literature for continuing health professional education and concluded that health professionals' continuing development is affected by their ability to document different levels of change.²⁸ One method shown to influence change in behavior is a documented commitment to change. A study of 207 physicians who expressed a commitment to change following a continuing education program were more

likely to change their actual prescribing compared to a control group of physicians.⁸

While CPD has been implemented in Canada, Great Britain and New Zealand, little quantitative data has been published from their experiences. After 10 years, over 2000 pharmacists have been assessed through the Ontario program. Overall, only 12% of pharmacists required remediation with pharmacists who graduated more than 25 years ago and those trained internationally requiring the most additional training.²⁹ CPD has been a requirement in Great Britain since 2005. In 2001, 21 community pharmacists were interviewed to assess their knowledge of CPD. Less than a third of the pharmacists had a CPD portfolio, with lack of time as the most common barrier. Most of the pharmacists did not assess their needs through a systematic process but rather by practice situations.³⁰ The results from this small study are similar to what was seen in our study.

Other qualitative research and editorial opinions agree with our research and have concluded to achieve its greatest potential, CME must be truly continuing, not casual, sporadic or opportunistic.^{6,7} The goal of this pilot program was not to replace CE activities but rather to provide individual pharmacists with skills and resources to make the CE activities in which they participate more relevant and applicable to their professional practice, learning needs, and objectives. The question of whether the CPD model used in this study maintains and improves professional competencies was not an objective of this study and will remain difficult to evaluate or prove in subsequent studies. Furthermore, the implications of profession-wide implementation have yet to be discussed and fully explored in the United States.

There are no current indications that the core requirements for maintenance of licensure for pharmacists, ie, mandatory completion of a prescribed number of hours of CE, are likely to change in the near future. Recent changes, however, in accreditation standards for CE providers that place a stronger emphasis on learning outcomes, application of learning in practice, and evaluation of the impact on patient care should also lead to pharmacists becoming more engaged in their learning. This should facilitate a shift from a provider-driven, hours-based model to a learner-driven, needs-based model for lifelong learning and professional development. Providers of CE should start by instilling an awareness of the concepts and components of CPD and expand their roles to become facilitators of CPD and “partners of learning.”

Limitations

The CPD taskforce recognized early in discussions of the pilot program that pharmacists volunteering to partic-

ipate would likely exhibit a high degree of innovativeness. While the recruitment of all volunteers for the program and subsequent randomization into the study and control group meant that the 2 groups were as similar as possible, the results may not be easily extrapolated to the general pharmacist population.

The study was severely limited by participant attrition, possibly due to personal and professional time constraints, a factor seen in other studies.^{22,31,32} Matched prestudy and poststudy survey data for study participants required that incomplete survey responses be excluded from final analysis and therefore resulted in smaller final numbers. Participant follow-up of anonymous volunteers, centralized coordination, and collection of data across 5 states also proved to be a challenge.

Survey data using yes/no responses and Likert-scale items are not nominal; therefore, primarily descriptive statistics must be used for analysis. Nonparametric statistical techniques limited our ability to make absolute statements about the results.

SUMMARY

This 5-state pilot study has shown that with deliberate and consistent training, support, and follow-up, pharmacists can develop the knowledge and skills to adopt a CPD approach to their lifelong learning and professional development, including the creation and maintenance of a personal CPD portfolio. When compared to pre-CPD training, participation in CE activities enhanced the professional knowledge of the study group pharmacists to a larger extent. The more structured approach to learning positively impacted pharmacists. The pilot program identified some challenges experienced by pharmacists when adopting a CPD approach, potential issues associated with the implementation of a voluntary system, and areas where improvements could be made to better support pharmacists. Overall, it proved to be a valuable first step in evaluating a CPD model for pharmacists in the United States. Data obtained through this study can inform future implementation strategies in the event that the profession decides to move in this direction.

ACKNOWLEDGMENTS

The contributions of all facilitators, trainers, and faculty members involved in the design, planning, and implementation of the pilot programs is gratefully acknowledged. Special recognition goes to the 5 state coordinators (Tabitha Cross, MSED, CAE, Director of Professional Development, Indiana Pharmacists Alliance; Jennifer Moulton, BSPharm, RPh, Senior Vice President, Educational Affairs, Iowa Pharmacy Association; Stephen Caiola, MS, FRSH, Associate Professor & Chair, Division

of Pharmacy Practice & Experiential Education, UNC Eshelman School of Pharmacy, University of North Carolina at Chapel Hill; and Jeff Rochon, PharmD, Director of Professional Development, Washington State Pharmacy Association) and Zubin Austin, PhD, MBA, MIS, BScPharm, Faculty of Pharmacy, University of Toronto, Toronto, Canada; Al Hanson, PhD, RPh, Professor, Chair of Extension Services in Pharmacy, University of Wisconsin-Madison; Randy McDonough, PharmD, MS, GCP, BCPS, Director of Clinical Services, Towncrests and Medical Plaza Pharmacies; Theresa Schindel, BSP, MCE, FCSHP, Director of Outreach Education, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta, Edmonton, Canada; and Roberta Stasyk, BScPharm, MEd, RPh, Competence Director, Alberta College of Pharmacists, Edmonton, Alberta, Canada.

The ideas expressed in this manuscript are those of the authors and in no way are intended to represent the position of the Accreditation Council for Pharmacy Education (ACPE) or the National Association of Boards of Pharmacy (NABP).

REFERENCES

1. 2009 Survey of Pharmacy Law. National Association of Boards of Pharmacy. Mt. Prospect, IL; 2008.
2. Citizen Advocacy Center. Report from a survey of continuing competence activity by regulatory boards and voluntary certification bodies and specialty boards. Washington, DC; 2002.
3. Debuss JJ. Address of the chairman. Proceedings, joint meeting of boards and colleges. District No. 2. Chicago, IL: National Association of Boards of Pharmacy; 1941:5.9.
4. Final Report AACP-APhA Task Force on Continuing Competence in Pharmacy. *J Am Pharm Assoc.* 1975;NS15(8):432-437.
5. Knox AB. Continuing education of pharmacists. *J Am Pharmacists Assoc.* 1975;15(8):442-447;457.
6. Mazmanian PE, Davis DA. Continuing medical education and the physician as a learner. *JAMA.* 2002;288(9):1057-1060.
7. Davis DA, Thompson MA, Oxman AD, Haynes RB. Changing physician performance: a systematic review of the effect of continuing medical education. *JAMA.* 1995; 274: 700-705.
8. Wakefield J, Herbert C, Maclure M, et al. Commitment to change statements can predict actual change in practice. *J Continuing Educ Health Professions.* 2003;23(2):81-93.
9. Kohn LT, Corrigan JM, Donaldson MS, eds. *To Err is Human: Building a Safer Health System.* Institute of Medicine Committee on Quality of Health Care in America. Washington, DC: National Academy Press; 2000.
10. Council on Credentialing in Pharmacy. Resource Document Continuing Professional Development in Pharmacy. 2004. Available at: <http://www.pharmacycredentialing.org/ccp/Files/cpdprimer.pdf>. Accessed February 10, 2010.
11. Accreditation Council for Pharmacy Education. Statement on Continuing Professional Development. 2003. Available at: [http://www.acpe-accredit.org/pdf/ACPE Statement on CPD Sept 2003.pdf](http://www.acpe-accredit.org/pdf/ACPE%20Statement%20on%20CPD%20Sept%202003.pdf). Accessed February 10, 2010.
12. Rouse MJ. Continuing professional development in pharmacy. *Am J Health-Syst Pharm.* 2004;61(19):2069-2076.
13. Marchington M, Wilkinson A. Human resource management at work: people management and development. United Kingdom: CIPD Publishing; 2005.
14. International Pharmaceutical Federation. FIP Statement of Professional Standards: Continuing Professional Development. 2002. http://www.fip.org/www/uploads/database_file.php?id=221&table_id=. Accessed February 23, 2010.
15. National Association of Boards of Pharmacy. Resolution 99-7-03. <http://www.nabp.net/ftpfiles/AM/FinalResolutions99thAM.pdf>. Accessed February 10, 2010.
16. American Association of Colleges of Pharmacy. House of Delegates Resolution, 2003. <http://www.aacp.org/governance/HOD/Documents/Cumulative%20Policies,%201980-2009.pdf>. Accessed February 23, 2010.
17. American Society of Health-System Pharmacists. Policy Positions: 1982-2008. http://www.ashp.org/DocLibrary/BestPractices/BP_PolPos08.aspx. Accessed February 10, 2010.
18. American Pharmacists Association. 2005 APhA Policy Committee: Continuing Professional Development. <http://www.pharmacist.com/AM/PrinterTemplate.cfm?Section=Home2&TEMPLATE=/CM/HTMLDisplay.cfm&CONTENTID=2479>. Accessed February 10, 2010.
19. The Joint Commission of Pharmacy Practitioners. An Action plan for Implementation of the JCPP Future Vision of Pharmacy Practice. January 2008. <http://www.ascp.com/advocacy/coalitions/upload/JCPP-FinalReport.pdf>. Accessed February 10, 2010.
20. Austin Z, Croteau D, Marini A, Violato C. Continuous professional development: The Ontario experience in professional self-regulation through quality assurance and peer review. *Am J Pharm Educ.* 2003;67(2):Article 56.
21. James D, Beaumont S, Carter S, et al. A framework for assessing the continuous professional development needs of community pharmacists. *Pharm Educ.* 2002;(2):63-68.
22. The Society. Implementing the CPD programme. *Pharm J.* 2002;269(7212):262-263.
23. Austin Z. Development and validation of the Pharmacists' Inventory of Learning Styles (PILS). *Am J Pharm Educ.* 2004;68(2):Article 37.
24. Elwyn G, Carlisle S, Hocking P, Smail S. Practice and professional development plans (PPDPs): Results of a feasibility study. *BMC Fam Pract.* 2001;2:1.
25. Cox CL, Baker MG. Evaluation: the key to accountability in continuing education. *J Continuing Educ Nurs.* 1981;12(1):11-19.
26. Stein LS. The effectiveness of continuing medical education: eight research reports. *J Med Educ.* 1981;56(2):103-110.
27. Manning PR, Petit DW. The past, present, and future of continuing medical education: achievements and opportunities, computers and recertification. *JAMA.* 1987;258(24):3542-3436.
28. Nona DA, Kenny WR, Johnson DK. The effectiveness of continuing education as reflected in the literature of the health professions. *Am J Pharm Educ.* 1988;52(2):111-117.
29. Driesen A, Verbeke K, Simoens, Laekeman G. International trends in lifelong learning for pharmacists. *Am J Pharm Educ.* 2007;71(3):1-10.
30. Atwell J, Blenkinsopp A, Black P. Community pharmacists and continuing professional development—a qualitative study of perceptions and current involvement. *Pharm J.* 2005;274:519-524.
31. Hanson AL, Bruskiwicz RH, DeMuth JE. Pharmacists' perceptions of facilitators and barriers to lifelong learning. *Am J Pharm Educ.* 2007;71(4):67.
32. Hanson AL, DeMuth JE. Facilitators and barriers to pharmacists' participation in lifelong learning. *Am J Pharm Educ.* 1991;55(1):36-39.