

Original Research

Assessing the perceptions of pharmacists working in Lebanese hospitals on the continuing education preferences

Katia ISKANDAR^{id}, Etwal BOU RAAD^{id}, Souheil HALLIT^{id}, Nibal CHAMOUN^{id}, Ulfat USTA^{id},
Youssef AKIKI^{id}, Lamis R. KARAOUI^{id}, Pascale SALAMEH^{id}, Rony M. ZEENNY^{id}.
Received (first version): 24-Nov-2017 Accepted: 8-Apr-2018 Published online: 18-May-2018

Abstract

Background: Continuing education (CE) is an international tool that requires lifelong active participation in learning activities allowing the pharmacist to stay a major player among others. In 2014 the CE program was introduced to the pharmacists licensed in Lebanon as a mandatory requirement for re-licensure. In the absence of guidelines regarding the quality and quantity of CE programs, behavioral resistance to precipitate in the CE programs might be encountered among the pharmacists.

Objective: The objective of this study is to assess the perceptions of pharmacists working in Lebanese hospitals on the continuing education preferences. The advantage of this program is to collect information that would help the Order of Pharmacy in Lebanon to upgrade the CE program in a way that is more acceptable and convenient for the pharmacists.

Methods: A cross-sectional study was carried out in 2016, using a proportionate random sample of Lebanese hospital pharmacies from all governorates in Lebanon. A structured questionnaire was distributed to all hospital pharmacies in Lebanon. Descriptive statistics were calculated for all study variables. This includes the mean and standard deviation for continuous measures, counts and percentages for categorical variables

Results: A total of 107 (53.5%) participants completed the questionnaires. The majority of participants were from Beirut and Mount Lebanon. The percentage of participants working at private hospitals was (68.2%). The majority of participants who completed the questionnaire (86.2%) agreed that continuing education programs affects their way of practice and increases their knowledge. Their preferred CE types to be used in the future were the computer based ones (60.6%), interactive workshops (45.5%) and printed materials (44.9%). Their considerations for selecting the CE type is based on their interest in the topic (80.6%), the ease of access to print or online material (77.2%), or the convenience of being offered during an event (67.1%). Participants noted that barriers to attend live CEs were mainly work responsibilities (76%), travel distance (65.6%), family commitments (48.4%) and scheduling (40.6%).

Conclusions: Lebanese hospital pharmacists are highly committed to CE. They consider it a practical tool for career development and advancement.

Keywords

Education, Pharmacy, Continuing; Attitude of Health Personnel; Pharmacists; Pharmacy Service, Hospital; Surveys and Questionnaires; Lebanon

INTRODUCTION

In recent years, pharmacy practice has shifted from product oriented to patient-oriented services, and pharmacist's knowledge is currently a pre-requisite for patient-centered

care practice.¹ Continuing improvement is one of the most important standard and a requirement in pharmacy education which contains programs that ensure that pharmacy practice and educational programs are heightened and advanced. Continuing education (CE) is a part of the continuous improvement standard. It is well recognized as part of the professional pharmacy landscape.¹ It is an international tool that entails lifelong active participation in learning activities, allowing pharmacists to keep their knowledge up to date, to assert their skills and to play a major player among other healthcare professionals.²⁻⁴ In 2009, the Accreditation Council for Pharmacy Education defined Continuing Education for the profession of pharmacy as "a structured educational activity designed or intended to support the continuing development of pharmacists and/or pharmacy technicians to maintain and enhance their competence".⁵

Pharmacy profession mirrors the broader health care community; as such it is continuously changing and increasing in complexity. As new technologies are added to the therapeutic armamentarium, pharmacists must attain new knowledge, skills, attitudes, and behaviors to be able to optimally apply these new therapeutic modalities to

Katia ISKANDAR. PharmD, MPH. School of Pharmacy, Lebanese International University, & Faculty of Pharmacy, Lebanese University. Beirut (Lebanon). katia_iskandar@hotmail.com
Etwal Bou RAAD. PharmD, MPH. School of Pharmacy, Lebanese International University. Beirut, (Lebanon). etwal.bouraad@liu.edu.lb
Souheil HALLIT. PharmD, MSc, MPH, PhD. Research Department, Psychiatric Hospital of the Cross. Jal Eddib; & Faculty of Medicine and Medical Sciences, Holy Spirit University. Kaslik (Lebanon). souheilhallit@hotmail.com
Nibal CHAMOUN. PharmD. School of Pharmacy, Lebanese American University. Byblos (Lebanon). Nibal.chamoun@lau.edu.lb
Ulfat USTA. PharmD. Pharmacy Department, American University of Beirut Medical Center. Beirut (Lebanon). uu00@aub.edu.lb
Youssef AKIKI. MBA. Faculty of Pharmacy, Lebanese University. Beirut; & Faculty of Business, Balamand University. Koura (Lebanon). Youssef_akiki@yahoo.com
Lamis R. KARAOUI. PharmD. School of Pharmacy, Lebanese American University. Byblos (Lebanon). lamis.karaoui@lau.edu.lb
Pascale SALAMEH. PharmD, MPH, PhD. Faculty of Medicine & Faculty of Pharmacy, Lebanese University. Beirut (Lebanon). pascalsalameh1@hotmail.com
Rony M. ZEENNY. PharmD, MPH. Pharmacy Department, American University of Beirut Medical Center. Beirut (Lebanon). rony_zeenny@hotmail.com

patient care.⁶ In Lebanon, the CE is mandatory since the enactment of the Law No. 190 on November 18, 2011. Its implementation started on January 1, 2014 by the Order of Pharmacists of Lebanon (OPL). The law mandates a total of 45 credits to be documented in a 3-year cycle; one-third of which must be CEs during attended as a seminar. The law was put into effect in 2016 with an amended requirement for an extended first cycle (60 credits to be completed by December 2019) then 45 credits thereafter per 3-year cycle. Like all other countries with CE requirements, the system is credit-based or time-based, and learners are, in most cases, only required to provide evidence of participation during the CE duration.⁷

Substantial differences in requirements for pharmacist license renewal exist globally in terms of quality and quantity of CE.⁸ Till this date, there is no standard program or clear guideline that describes the component of the CE programs. In Finland, the universities for example can provide most of the CE curricula for pharmacists by following their own standards or the standards of the pharmaceutical learning center. On the contrary, CEs in Canada are accredited by the national council for continuing education in Pharmacy practice and the provincial regulatory authority. Furthermore, the quality of each CE activity is subject to evaluation by the Portuguese Pharmaceutical Society.⁹

Pharmacist or their employers might not perceive the value of the CE programs in advancing the knowledge and practice especially in the absence of program evaluation. As such mandatory requirement CE credits may lead to a disengaged, dependent, and passive form of learning.^{10,11} Other barriers would also prevent pharmacist from attending CE such as lack of dedicated time to attend the sessions, perceived lack of relevant CE activities and lack of opportunity for attending CEs.^{9,12} The OPL played a vital role in monitoring and evaluating the CE programs that were provided to the pharmacists in Lebanon. Despite the efforts that have been implemented to promote the effectiveness of the CE programs in advancing and updating pharmacist knowledge, the OPL perceived some resistance from the pharmacist to the current CE program. Therefore, the main objective of this study is to assess the perception and views of Lebanese hospital pharmacists towards the current continuing education programs. In addition, this study will determine hospital pharmacist preferences for a CE program. The aim of this study is to collect data that might help in formulating a sustainable CE program that will be based on the hospital pharmacist needs.

METHODS

General study design

A cross-sectional study was carried out in 2016, using a proportionate random sample of Lebanese pharmacies

from all governorates in Lebanon (Beirut, Mount Lebanon, North, South and Bekaa). A list of 148 hospital pharmacies was provided by the OPL, which includes a total of 328 hospital pharmacists who are registered as licensed pharmacists.

Data collection process

The detailed paper-based questionnaire (online appendix) was randomly distributed to pharmacists working in hospitals in Lebanon by the OPL inspectors. They are not related to the study, yet they received training by the study investigators about the study objectives and tool used. The OPL investigators in turn explained the study objectives to each pharmacist. When consent of participation was granted, the pharmacist received the anonymous and self-administered questionnaire. At the end of the process, the completed questionnaires were collected back by the inspectors and sent back for data entry by the study investigators. During the data collection process, the anonymity of the pharmacists was guaranteed. On average, participants completed the questionnaire within approximately 15 minutes. The pharmacist had the choice to accept or refuse to fill the questionnaire. The Lebanese University ethics committee waived the need for approval since the study was observational, anonymous and respected the individuals' confidentiality.

The anonymous questionnaire was in French or English language, based on a thorough review of the related literature¹³⁻¹⁷; it was composed of different sections: socio-demographic characteristics, characteristics of the hospital (number of beds, opening hours of the pharmacy, on call pharmacy service, number of employees in the pharmacy, qualifications of the employees and their working schedule).

Further questions were related to the perception of the CE program offered in Lebanon, topic interest, format of CE activities they used to meet their required needs, preferred CE activity they would like to use in the future, reasons for using such format and level of level of satisfaction for each. The questionnaire assessed obstacles that prevent the pharmacist from attending CE sessions and included a section at end where the participants can suggest CE topics of interest. The questionnaire was piloted in a group of 10 hospital pharmacists before being used.

Statistical analysis

Data entry was completed by an independent person who was not involved in the data collection process. Descriptive statistics were calculated for all study variables. This includes the mean and standard deviation for continuous measures, counts and percentages for categorical variables. The statistical package SPSS version 23 was used for all statistical analysis.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The value that your employer places on your participation in continuing education	19 (19%)	8 (8%)	32 (32%)	19 (19%)	22 (22%)
Your interest in/value of continuing education	2 (2%)	3 (3%)	9 (8.9%)	28 (27.7%)	59 (58.4%)
Continuing education affects the way you practice	2 (2%)	3 (3%)	9 (8.9%)	33 (32.7%)	54 (53.5%)
Continuing education helps increase your knowledge	1 (1%)	2 (2%)	3 (3%)	33 (32.7%)	62 (61.4%)

	What type of continuing education have you used in the past?	What type of continuing education would you prefer to use in the future?
Live in-person	37 (37%)	29 (30.2%)
DVD/Video/audio	31 (31%)	21 (21.2%)
Computer/Internet based	71 (71%)	60 (60.6%)
Printed materials	64 (54%)	44 (44.9%)
Interactive workshop	38 (38%)	45 (45.5%)
Journals	31 (31.3%)	35 (35.4%)
Webinar	34 (34%)	23 (23.5%)
Textbooks/reference books	40 (40%)	20 (20.4%)
Medical search engines	16 (16.7%)	13 (13.3%)
Others :please specify:	2 (1.9%)	2 (1.9%)

RESULTS

Out of 200 pharmacists who were approached by interviewers, a total of 107 (53.5%) participants completed the questionnaires from October 2016 through December 2016. The majority of participants were from Beirut and Mount Lebanon where the majority of the participants worked in private hospitals (68.2%). The results indicated that 19.7% have achieved a certification for a specialty practice or disease management, with 32.5% among whom practicing in the discipline of their certification. In regards to professional affiliations besides the Lebanese Order of Pharmacists, 17.7% of participants are members in professional organizations such as the American Health-System Pharmacists (ASHP), and the American Clinical College of Pharmacy (ACCP).

The participants agreed that 41% of their employers place high interest on their participation in continuing education, compared to the interest of the participants themselves (86.1%). The majority of the participants (86.2%) agreed that continuing education affects their way of practice and helps increasing their knowledge (94.1%) (Table 1).

The participants were asked about the most common format of continuing education that they have used in the past, and the responses were the followings: computer/internet based ones (71%), printed materials (54%) and textbooks (40%). On the other hands, they highlighted that their preferred format of CE is computer/internet based ones (60.6%), followed by interactive workshop (45.5%) and printed materials (44.9%) (Table 2). Their considerations for selecting the CE format was mostly based on their interest in the topic (80.6%), the ease of access to print or online material (77.2%), or the convenience of being offered during an event that they are already attending (67.1%) (Table 3).

Participants acknowledged that they were mostly satisfied with CEs when they attended computer/internet based ones (76.1%), followed by live/in-person ones (75.2%), interactive workshop (67.8%) (Table 4).

Participants highlighted that the barriers to attend live CEs

were mainly work responsibilities and scheduling (76%), distance that they have to travel to reach the designated site (65.6%) and family commitments (48.4%) (Table 5).

When asked about their interest in the following preselected topics, the participants highlighted the followings: Innovations in pharmacy practice (84.5%), Innovations in drug press (82.6%), Innovations in disease management (82.5%), pharmacy management (81.3%), skills development (77.4%), and humanities or psychology topics (42.5%) (Table 6).

In the comment section, four pharmacists highlighted their interest in topics such as drug-drug interactions, antimicrobial stewardship, neonates dosing, and new updates in commonly used drugs.

DISCUSSION

In this study, we were able to evaluate hospital pharmacists' perception, needs, barriers, experience and convenience of engaging in continuing education in Lebanon. This is the second study conducted in Lebanon after the one from last year among pharmacists practicing in the country.¹⁸

As more and more leading professional organizations are calling for radical changes in CE models for healthcare practitioners, advocating for continuing professional development, the OPL is engaged to meet these goals and started by conducting this study in order to explore ways to assist hospital pharmacists in developing and maintaining continuing competence, enhancing their professional practice, and supporting achievement of their career goals in order to implement CE models similar to the one adopted by the International Pharmaceutical Federation (FIP) in the second edition of its Global Framework for Quality Assurance of Pharmacy Education.¹⁹

This study showed that hospital pharmacists have an overall positive perception of CE sessions offered by the OPL regarding their objectives, plans, and acquired information. The majority of participants confirmed that

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Low or no cost	6 (6.5%)	6 (6.5%)	25 (27.2%)	39 (42.4%)	16 (17.4%)
Interested in /motivated to learn about topic regardless of the venue	0	5 (5.4%)	13 (14%)	48 (51.6%)	27 (29%)
Networking and socializing opportunities	1 (1.1%)	12 (13.2%)	29 (31.9%)	34 (37.4%)	15 (16.5%)
Offered during a conference or event already attending	4 (4.5%)	5 (5.7%)	20 (22.7%)	35 (39.8%)	24 (27.3%)
Effective advertising	7 (7.9%)	14 (15.7%)	20 (22.5%)	36 (40.4%)	12 (13.5%)
Easily accessed print or online material	2 (2.2%)	3 (3.3%)	16 (17.4%)	40 (43.5%)	31 (33.7%)

Table 4. Level of Satisfaction with different types of CE (N=107)

Rate your level of satisfaction with the types of CE you have participated in	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Live in-person	1 (1.1%)	5 (5.4%)	17 (18.3%)	55 (59.1%)	15 (16.1%)
Computer/Internet based	1 (1.1%)	3 (3.3%)	18 (19.6%)	55 (59.8%)	15 (16.3%)
Interactive workshop	3 (3.4%)	5 (5.7%)	20 (23%)	40 (46%)	19 (21.8%)
DVD/Video/audio	11 (13.4%)	6 (7.3%)	23 (28%)	31 (37.8%)	11 (13.4%)
Printed materials	2 (2.3%)	5 (5.8%)	22 (25.6%)	48 (55.8%)	9 (10.5%)
Journals publications	13 (15.1%)	4 (4.7%)	27 (31.4%)	36 (41.9%)	6 (7%)
Medical search engines	14 (16.3%)	8 (9.3%)	21 (24.4%)	37 (43%)	6 (7%)
Authorship textbooks/reference books	6 (6.7%)	3 (3.4%)	25 (28.1%)	46 (51.7%)	9 (10.1%)

the sessions enhanced their knowledge and induced changes in their daily practice. The introduction of the OPL mandated CE requirements seem to have instilled the motivation to enhance professional practice and advances in career goals. The most preferred topics for the hospital pharmacists were innovations in disease management and pharmacy practice followed by pharmacy management. These findings are consistent with previously published literature showing more interest in patient care related CE given the multitude of new drugs, treatment guidelines, and development of new treatment methods.¹⁹ This area was also observed to be the category of preference for pharmacists in a study by Wanzie *et al.* in 1990, reflecting a shift from programs related to dispensing functions to more clinically oriented topics.²⁰

Self-study CE format including computer based, printed materials, textbooks and journals is the most commonly used method, while internet based CEs is identified as the preferred method. Inclination towards online CE has also been reported in the literature because individuals are able to complete their requirements at their leisure, have more time with their family, eliminate travel and lodging and reduce or eliminate program costs in case of free self-study courses.²¹ Even though self-study was the most commonly used method to obtain CE, pharmacists are more interested in live lectures as they are usually organized by national or international professional societies in specialty or generalized fields, offering a wealth of activities and networking opportunities for health system pharmacists. Factors that prevented hospital pharmacists from attending live CEs were primarily job responsibilities followed by distance travel and then family commitment. These barriers are similar to those identified in other surveys of Flemish, Egyptian and Qatari pharmacists commonly cited time considerations and excessive workload or job constraints, scheduling (location, distance, time) and family constraints, indicating that hospital pharmacists have similar views of CE barriers across many countries.^{22,23}

Furthermore, less than half of the participants indicated that their employer placed high interest in their participation in continuing education as compared to the interest of the participants themselves. These findings might be explained by the wealth of free activities provided by professional body or associations, the limited budget for professional development reimbursement and the contributions provided by pharmaceutical companies to hospital pharmacists (e.g. support to attend international conferences). Despite the limited support provided by employers, pharmacists participated and showed interest in CE sessions even though not required by their employers

with the objectives of self-fulfillment and increasing job competence as major motivational factors

Although the survey results reflected a subjective assessment of pharmacists' learning experience, outcomes of the training and willingness to apply the learning to practice are rarely evaluated or quality assured, and therefore it is difficult to infer a change in patient care due to the CE. Quite often, CE courses provide general updates and reviews, rather than experience focused learning on particular practice situations where actual skills can be simulated and tested. A wealth of literature has shown that active and case based learning provide pharmacists with the opportunity of increased retention.²⁴ Studies evaluating the impact of CEs on medical doctors and health care outcomes showed that didactic lectures alone do not appear to change physician performance, whereas some evidence exists that interactive CE engage the participant and can potentially affect professional practice and health care outcome.²⁵

In Lebanon, the OPL, through the scientific committee is trying to implement radical changes in CEs by creating different sub-committees among which the hospital pharmacist subcommittee is engaged in boosting practitioners interest and participation in CEs and in assessing and exploring unmet needs tailored to the hospital pharmacists continuing education and finding ways to collaboratively enhance the practice performance in terms of quality assurance, medication safety, management skills development, clinical knowledge optimization and ultimately meeting patient safety goals that is the core of pharmacy practice. Such initiatives are encouraged.

Limitations

This pilot study adds value to the offerings of future CE activities in order to meet Hospital pharmacists' expectations. However, high response rate was noted in some regions in Lebanon as compared to others and the study focused on hospital pharmacy practitioners; therefore, a selection bias is possible and the generalization to all Lebanese pharmacy practitioners remains

Table 5. Reasons preventing Attending Live CE's (N=107)

Reasons	N (%)
Cost	23 (24%)
Timing of talk	39 (40.6%)
Family commitment	46 (48.4%)
Work responsibilities	73 (76%)
Interest in the topic	35 (36.5%)
Easier to receive print/electronic material	18 (18.8%)
Distance Travel	63 (65.6%)
Others	9 (8.4%)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Innovations in disease management	7 (7.2%)	1 (1%)	9 (9.3%)	46 (47.4%)	34 (35.1%)
Humanities or psychology topic	4 (4.2%)	10 (10.4%)	41 (42.7%)	26 (27.1%)	15 (15.6%)
Innovations in pharmacy practice	2 (2.1%)	1 (1%)	12 (12.4%)	32 (33%)	50 (51.5%)
Innovations in drug press	4 (4.3%)		12 (13%)	44 (47.8%)	32 (34.8%)
Results in skill development	5 (5.3%)	1 (1%)	25 (26.3%)	39 (41.1%)	25 (36.3%)
Pharmacy management concepts	1 (1%)		17 (17.7%)	40 (41.7%)	38 (39.6%)

inadequate. The data in this study are survey based and rely on self-reported information, which may lead to an information bias. Therefore, we recommend nationwide survey involving pharmacy practitioners working in different institutions and healthcare settings.

CONCLUSIONS

In conclusion, Lebanese hospital pharmacists are highly committed to continuing education. They consider it a practical tool for career development and advancement. Work and family commitments, time constraints and geographic location (travelled distance) were considered as barriers for attending live CE sessions. Future proposed CE programs should be comprehensive, designed to fill the gaps between the knowledge and practice in the healthcare. This goal can be achieved by enhancing the engagement and support of employers and by the

collaborative work of Pharmacy regulators and CE providers to define the skills and competencies and offer CE programs intended for self-directed, life-long learning.

ACKNOWLEDGMENT

Special thanks to the OPL inspectors and the OPL scientific committee- Hospital and Clinical Pharmacy subcommittee for their help in this project.

CONFLICT OF INTEREST

The authors have nothing to disclose.

FUNDING

None.

References

- Biggs D. Issues in continuing professional development for pharmacists. *Bulletin of the Kuwait Institute for Medical Specialization*. 2003;2:55-58.
- FIP. Appendix 5: Summary of CPD and CE systems by country, *Global Pharmacy Workforce and Migration Report*. 2006.
- Institute of Medicine. *Redesigning Continuing Education in the Health Professions*. Washington: IOM; 2010.
- ACPE. *Accreditation Standards for Continuing Pharmacy Education*. Chicago: ACPE; 2007.
- ACPE. Definition of Continuing Education for the Profession of Pharmacy. Available at: <https://www.acpe-accredit.org/pdf/DefinitionContinuingEducationProfession%20Pharmacy2015.pdf> (accessed Nov 24, 2017).
- Nesterowicz K, Librowski T, Edelbring S. Validating e-learning in continuing pharmacy education: user acceptance and knowledge change. *BMC Med Educ*. 2014;14:33. doi: [10.1186/1472-6920-14-33](https://doi.org/10.1186/1472-6920-14-33)
- Center. Report from a Survey of Continuing Competence Activity by Regulatory Boards and Voluntary Certification Bodies and Specialty Boards. 2002.
- Mestrovic A, Rouse MJ. Pillars and foundations of quality for continuing education in pharmacy. *Am J Pharm Educ*. 2015;79(3):45. doi: [10.5688/ajpe79345](https://doi.org/10.5688/ajpe79345)
- FIP. *Quality Assurance of Pharmacy Education: the FIP Global Framework*. The Hague: FIP; 2014.
- Gitterman A. Interactive andragogy: principles, methods, and skills. *J Teach Soc Work*. 2004;24(3-4):95-112.
- Kaufman DM. Applying educational theory in practice. *BMJ*. 2003;326(7382):213-216.
- FIP. *A Global Framework for Quality Assurance of Pharmacy Education*. The Hague: FIP. 2008.
- ACPE. *Accreditation Standards for Continuing Pharmacy Education*. Available from: https://www.acpe-accredit.org/pdf/CPE_Standards_Final.pdf (accessed Nov 24, 2017).
- Alkhateeb FM, Attarabeen OF, Alameddine S. Assessment of Texan pharmacists' attitudes, behaviors, and preferences related to continuing pharmacy education. *Pharm Pract (Granada)*. 2016;14(3):769. doi: [10.18549/PharmPract.2016.03.769](https://doi.org/10.18549/PharmPract.2016.03.769)
- Pharmacists: Occupational Outlook Handbook: U.S Bureau of Labor Statistics. Available at: <http://www.bls.gov/ooh/healthcare/pharmacists.htm#tab-2> (accessed Nov 24, 2017).
- American College of Clinical Pharmacy, Hume AL, Kirwin J, Bieber HL, Couchenour RL, Hall DL, Kennedy AK, LaPointe NM, Burkhardt CD, Schilli K, Seaton T, Trujillo J, Wiggins B. Improving care transitions: current practice and future opportunities for pharmacists. *Pharmacotherapy*. 2012;32(11):e326-e337. doi: [10.1002/phar.1215](https://doi.org/10.1002/phar.1215)
- Harris IM, Phillips B, Boyce E, Griesbach S, Hope C, Sanoski C, Sokos D, Wargo K. Clinical pharmacy should adopt a consistent process of direct patient care. *Pharmacotherapy*. 2014;34(8):e133-e148. doi: [10.1002/phar.1459](https://doi.org/10.1002/phar.1459)
- Saade S, Ghazala F, Farhat A, Hallit S. Attitudes towards continuous professional development: a study of pharmacists in Lebanon. *Pharm Pract (Granada)*. 2018;16(1):1103. doi: [10.18549/PharmPract.2018.01.1103](https://doi.org/10.18549/PharmPract.2018.01.1103)
- FIP statement of professional standards: continuing professional development. The Hague: FIP; 2002.

20. Wanzie PM GR, Wiley SW. Assessment of the continuing professional education needs of Pennsylvania pharmacists. Poster presentation at the ASHP Midyear Clinical Meeting, Las Vegas, December 6, 1990.
21. Scott VG, Amonkar MM, Madhavan SS. Pharmacists' preferences for continuing education and certificate programs. *Ann Pharmacother*. 2001 Mar;35(3):289-299. doi: [10.1345/aph.10191](https://doi.org/10.1345/aph.10191)
22. Driesen A, Verbeke K, Simoens S, Laekeman G. International trends in lifelong learning for pharmacists. *Am J Pharm Educ*. 2007;71(3):52.
23. Hanson AL, Bruskiwitz RH, Demuth JE. Pharmacists' perceptions of facilitators and barriers to lifelong learning. *Am J Pharm Educ*. 2007;71(4):67.
24. Forsetlund L, Bjørndal A, Rashidian A, Jamtvedt G, O'Brien MA, Wolf F, Davis D, Odgaard-Jensen J, Oxman AD. Continuing education meetings and workshops: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev*. 2009;(2):CD003030. doi: [10.1002/14651858.CD003030.pub2](https://doi.org/10.1002/14651858.CD003030.pub2)
25. Davis D, O'Brien MA, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. Impact of formal continuing medical education: do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *JAMA*. 1999;282(9):867-874. doi: [10.1001/jama.282.9.867](https://doi.org/10.1001/jama.282.9.867)