RESEARCH

Type and Extent of Opioid-Related Education Provided by U.S. College of Pharmacy Continuing Education Divisions

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Objective. 1) To quantify the number and type of new opioid-related continuing pharmacy education (CPE) activities offered by Accreditation Council for Pharmacy Education (ACPE)-accredited continuing education divisions (CEDs) at U.S. colleges of pharmacy from 2015-2018. 2) To describe the number of pharmacists who complete opioid-related CPE activities.
Methods. The data source was the ACPE database of CPE activities. Data was filtered to include college of pharmacy CPE providers. Six keywords ("opiates", "opioids", "pain", "pain management", "drug overdose", and "opioid antagonist") were queried for the years 2015-2018. Activity title, contact hours, activity type, activity format, and number of pharmacist participants were extracted. Descriptive statistics were used. A content analysis of activity titles was performed.
Results. Overall, college of pharmacy providers delivered 20.3% of ACPE-approved opioid-related CPE activities from 2015 – 2018. The number of new CPE activities increased from 249 to 297 to 349 in 2015, 2016, and 2017, respectively, and decreased to 342 in 2018 for a total of 1,237 unique opioid-related CPE activities. These activities reached 149,373 pharmacists and were most commonly affiliated with the keywords "opioids" (34.8%) and "pain management" (30.2%).
Conclusion. The opioid epidemic creates an opportunity for pharmacists to increase their roles in public health, but education is necessary to optimize these roles. Study findings indicate many pharmacists participate in opioid-related CPE provided by ACPE-accredited college of pharmacy CEDs. This number is likely to increase as a growing number of states are beginning to require opioid-related CPE for pharmacist license renewal.
Keywords: opioids, naloxone, continuing pharmacy education

INTRODUCTION

From 1997-2017, more than 700,000 people died from drug overdoses in the United States (U.S.), and 68% of the 70,200 drug overdose deaths in 2017 involved an opioid.[1] In addition to the high impact on mortality, the economic burden of the opioid epidemic has exceeded $1 trillion, and is projected to cost another $500 billion by 2020.[2,3] This cost is comprised of lost wages and productivity, increased health care costs, and increased use of the criminal justice system.[3] As a result, the opioid epidemic was declared a public health emergency in 2017 by the U.S. Department of Health and Human Services (DHHS).[4]

Since DHHS' declaration of the opioid public health emergency and subsequent release of a 5-Point Strategy to Combat the Opioid Crisis in 2017, the Centers for Disease Control and Prevention has worked to support and implement strategies to mitigate the opioid crisis.[4] The 5-Point Strategy includes improving access to prevention, treatment, and recovery services, including medication-assisted treatment (MAT).[5] Other aims focus on pain and addiction research, timely public health data reporting, and increased access to naloxone.[5]

Naloxone, an opioid antagonist, is recognized as the drug-of-choice for reversing an acute opioid overdose.[6] Pharmacists are highlighted in the DHHS Strategy as a member of the health care team who can provide naloxone via standing order, independent prescriptive authority, or by means of a collaborative practice agreement, depending upon state rules and regulations.[5,7-9] This aligns with a resolution endorsed by the National Associations of Boards of Pharmacy (NABP) titled "Increasing Patient Access to Naloxone Rescue Kits".[10] Pharmacists act as, "readily accessible member[s] of the healthcare team and play a major role in preventing prescription drug abuse", according to the NABP resolution

issued in 2016.[10] Naloxone access laws at the state-level which allow pharmacists to dispense naloxone have proven to be associated with increased naloxone dispensing and in turn a reduction of opioid overdose deaths.[11-13]

For pharmacists to effectively be engaged in this role, proper education and training is necessary. Many colleges of pharmacy across the nation have recognized that training in and out of the classroom is needed for future pharmacists to fully understand the impact of the opioid epidemic and have started to provide training for students in the Doctor of Pharmacy curriculum.[14-16] Less is known regarding the number of practicing pharmacists who have been educated on the opioid crisis and new laws surrounding naloxone prescribing and dispensing. In fact, numerous studies have found pharmacists to be in need of further education regarding this issue.[17-21] In response, some states are adding opioid-related education as a requirement for license renewal. As of October 2019, at least 7 states require pharmacists to submit at least one hour of continuing pharmacy education (CPE) on the topics of opioids or naloxone dispensing for annual or biennial license renewal.[22-28] Additionally, three states require CPE on controlled substances, and two states require at least one hour of CPE on pain management.[29-33]

The primary objective of this project was to quantify the number and type of new opioid-related CPE activities offered by ACPE-accredited continuing education divisions (CEDs) associated with U.S. colleges of pharmacy from 2015-2018 to understand the role of college of pharmacy CEDs in being responsive to developing programs that address emerging public health topics such as the opioid epidemic. The cumulative number of pharmacist participants in the opioid-related CPE activities is also described. This is the first study to use a national database to examine CPE activities.

METHODS

The Accreditation Council for Pharmacy Education (ACPE) database of continuing pharmacy education (CPE) activities was the data source for the study. CPE activities for the years 2015-2018 were included. Variables extracted for the study included CPE activity title, provider-type (ie, college of pharmacy), contact hours, type of activity (application or knowledge-based), format of activity (home-study or live), and keywords identified by CPE providers. Only college of pharmacy providers with ACPE accreditation status were included in this study. CPE providers self-select keywords from a list and keywords that were related to opioid programming were focused on for this study. Therefore, activities with keywords "opiates", "opioids", "pain", "pain management", "drug overdose", and "opioid antagonist" were included. Since pain and pain management are broad categories that may overestimate opioid-related CPE activities, the subset of keywords that were specific to opioids (opiates, opioids, drug overdose, and opioid antagonist) was also examined. Keywords were assigned by the provider of the activity and were not mutually exclusive for a given activity. To determine the extent of opioid-related CPE provided by colleges of pharmacy, the percentage of ACPE-accredited opioid-related CPE provided by colleges of pharmacy was calculated. This is a cumulative percentage of all opioid-related programs from 2015 – 2018 (ie, some programs are offered in multiple years and included in the cumulative percentage). To determine the number of new opioid-related CPE activities in years 2015 – 2018, initially, the total number of activities was counted for each keyword. Because an activity may have had more than one keyword, duplicates across all keywords were deleted to obtain the unique number of new activities for each keyword per year. Descriptive statistics (means, frequencies, percentages) were used to describe number of activities per keyword, overall activities per year, activity format, activity type, number of contact hours per each CE activity, number of pharmacists who completed the activities, and number of CEDs offering CPE activities per year.

Utilizing the same ACPE database of pharmacy CPE activities, two researchers performed a qualitative content analysis of the titles of each CPE activity title by year to identify and describe the topic areas conveyed by titles for each keyword. This was done to gain insight into the type of topic areas emphasized in each activity. The researchers independently reviewed titles and then had a consensus meeting to agree upon coding. A second consensus meeting was held to conduct a final review of coding and collapse categories with small numbers of titles (eg, harm reduction into naloxone, opioid toxicity into opioids). A title could be assigned to more than one category (eg, pain management and opioids), when applicable. The University of Texas at Austin Institutional Review Board prior approved this study.

RESULTS

Of the 145 accredited colleges of pharmacy in the U.S., 56% (n = 81) had ACPE-accredited CEDs at the time of data acquisition in September 2019. The number of CEDs with a new opioid and/or pain management-related activity in the ACPE database was similar from year to year, with 62, 68, 67, 68 in years 2015, 2016, 2017, and 2018 respectively. This indicates that over 75% of colleges of pharmacy with CEDs used their platform to deliver home or live study activities on at least one of the keywords queried each year. When examining the specific opioid-related keywords (opiates, opioids, drug overdose, opioid antagonist), only 42, 52, 57 and 59 college of pharmacy providers were represented in years 2015 through 2018, indicating approximately 52 to 73% of CEDs provided opioid-specific content over the four years.

Overall, college of pharmacy providers delivered 20.3% of 12,723 ACPE-accredited opioid-related CPE activities from 2015 – 2018. The number of new opioid-related CPE activities offered by U.S. college of pharmacy CEDs has increased since 2015. In 2015, 249 unique activities were offered among all keywords. In 2016, the number of activities increased by 19%, with 297 unique offerings. The number of offerings increased again from 2016 to 2017, by 17.5%, with 349 unique activities being offered in 2017. From 2017 to 2018, the number of unique activities decreased by 2% to 342. When looking at activity numbers by the subset of specific opioid-related keywords (opiates, opioids, drug overdose, opioid antagonist), there were 100, 139, 207, and 246 activities in years 2015, 2016, 2017, and 2018 respectively. The number of pharmacist learners across all keywords increased from 28,699 in 2015 to 50,167 in 2016 but decreased from 2016 to 2017 by 14,107 for a total of 36,060. This number decreased again the next year, with 34,357 pharmacist learners recorded in 2018 (See Table 1).

Activities were found to be most commonly affiliated with the keywords "opioids" (34.8%), "pain management" (30.2%), and "pain" (18.6%). One of the lowest keywords was "opioid antagonist" (2.5%), however, this keyword became available for providers to choose in 2017, so we were only able to retrieve two years of data. Table 1 includes a summary of activity numbers by keyword and year, as well as the number of pharmacists completing activities by year.

The average number of contact hours for activities was 1 to 2.1 hours for each keyword. Most activities (86.7%) were offered as live programming as opposed to home-study. Additionally, across each individual keyword and year observed, knowledge-based activities were more common than application-based activities, comprising 86.9% of the activities overall. Details on contact hours, activity setting, and activity type can be found in Table 2.

Activity titles most commonly contained some mention of pain management (25.6%) and/or opioids (25.5%) (See Table 3). Only 108 (6.7%) were coded to the naloxone category. Although it was not possible to identify activities by keyword "opioid antagonist" prior to 2017, this gives an indication of naloxone-related activities based on activity title. Under keywords "pain" and "pain management", several activities were coded to be condition, practice setting, or medication specific trainings. Other prevalent content categories include law, MAT/opioid use disorder (OUD), and addiction/drug abuse.

DISCUSSION

Study findings revealed that over 70% of colleges of pharmacy with an ACPE-accredited CED are engaged in opioid-related CPE which shows that they are being responsive to creating timely programming that aligns with emerging public health topics. A total of 1,237 unique activities were offered in the years 2015-2018, with 149,373 pharmacist participants. The majority of activities (83.6%) were found to include keywords "opioids", "pain", or "pain management".

As of May 2018, there were over 300,000 licensed pharmacists in the United States.[34] Although this analysis was unable to determine whether individual pharmacist learners completed multiple opioid-related CPE activities, these results suggest that many pharmacists have completed some type of opioid-related CPE in the timeframe of our study. As more states require opioid-related CPE for license renewal, this number is likely to increase. This number also does not reflect pharmacists who may have received CE credit from another provider such as a state or national pharmacy association.

The role of the pharmacist has changed over time, from that of strictly dispensing to include more patient care, medication and disease state counseling, and public health activities.[35,36] Due to advocacy efforts, college of pharmacy accreditation and CPE requirements, along with collaboration efforts among other healthcare professions, pharmacists have helped to address significant public health issues, such as deficits in adult immunization rates over the past two decades.[37] Similarly, in order to combat the opioid epidemic as a part of the health care team, it is essential for each practicing pharmacist to be educated and equipped to do so. Pharmacists across the nation have started this movement by utilizing available prescription drug monitoring programs to help prevent opioid diversion.[38] To build upon this, pharmacists should also be aware of opioid misuse warning signs, as well as hazardous medication combinations and inappropriate prescribing by providers.[38] While our study focused on CPE including content related to opioids, pain, and naloxone, we discovered that U.S college of pharmacy CEDs are utilizing their platform to address each component mentioned above so that pharmacists may have a comprehensive skillset to be effective in their role. The pharmacist numbers also suggest that college of pharmacy CEDs are reaching a large number of pharmacists via their CPE activities and can have a key role in education related to public health crises.

Recent studies have shown that while many pharmacy chains across the nation have adopted naloxone dispensing protocols and standing orders, there is still a gap in pharmacists' education and confidence to perform these tasks.[20,38,39] There have been five statewide analyses of pharmacy-based naloxone availability, all demonstrating gaps in access.[39-43] While our data analysis reveals a large set of CPE activities were offered on opioids and related topics over the past several years, a small number of titles were coded to the naloxone content category (6.7%). This is a gap in pharmacist education, and it is likely that the number of pharmacists who complete naloxone training will increase over time, especially as states are beginning to require CPE related to this topic for license renewal.[22-27] This trend follows the fact

that dissemination and implementation of strategies to address public health issues such as the opioid epidemic, which includes pharmacist education and training, takes time to be fully adopted across the profession.[44]

This study had several limitations. First, the available data was reported as annual number of activities and learners per de-identified provider rather than as number of learners per activity. Thus, we were unable to discern how many pharmacists were trained by a particular activity, or if one pharmacist completed more than one activity during the study timeframe. In addition, pharmacist learners reported by keyword were included from all programming available for that year and previous years as long as the program was not yet expired. Another limitation of this project is that only titles and keywords of activities in the ACPE database were accessible. Additional details such as activity learning objectives may have helped further examine the extent to which opioid-related topics were included in categories such as pain management. To mitigate this, we used activity titles to perform a qualitative content analysis to identify which titles were relevant. However, it is possible that misclassification bias occurred if an activity with a keyword such as "pain management" did not include opioid-related content. An additional limitation is that although the keyword "opioid antagonist" became available in 2017, there may be a lag in CE providers becoming aware of new keywords. Also, programs that were approved prior to 2017, are available up to three years, which means that the keyword "opioid antagonist" may have been applicable to some of these programs. Thus, the keyword "opioid antagonist" is likely relevant to more programs than is reported. Lastly, our analysis did not assess CE provided by other entities such as ACPE-accredited providers who work in partnership with colleges of pharmacy, employers, health systems, national/state pharmacy organizations, or private interest groups. Because of this, we are unable to draw any significant conclusions regarding the percentage of total pharmacists in the US trained on these key topics. Further, educational programming that is offered by ACPE-accredited providers, such as employer training, is not captured in this study.

CONCLUSION

Most CEDs at colleges of pharmacy have been responsive to providing opioid-related programming, a priority public health topic. CEDs should continue to focus on ways to expand their platform and pharmacist alumni networks and expert faculty clinicians to serve as leaders in their states and regions in the development of new, up-to-date content on public health issues such as the opioid epidemic. Although CEDs are providing opioid-related education, it is not known how the education ultimately impacts public health outcomes. In the case of opioid-related training, future research should focus on examining how CPE impacts outcomes such as the impact of opioid-related counseling on patient knowledge and naloxone dispensing patterns.

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Table 1. Summary of Opioid-Related Continuing Pharmacy Education Activities by Keyword and Year

	2015	2016	2017	2018	Totals
Keyword: Opiates					
Total activities[a]	14	13	15	20	62
Number of pharmacists[b]	1,160	4,476	1,123	1,140	8,339
Keyword: Opioids					
Total activities[a]	74	109	173	205	562
Number of pharmacists[b]	9,235	18,347	15,464	12,231	55,367
Keyword: Pain					
Total activities[a]	68	66	74	76	301
Number of pharmacists[b]	4,237	2,526	3,931	3,823	14,517
Keyword: Pain Management					
Total activities[a]	131	139	160	57	487
Number of pharmacists[b]	7,655	7,441	6,358	10,075	31,529
Keyword: Drug Overdose					
Total activities[a]	34	48	42	37	161
Number of pharmacists[b]	6,412	17,377	8,677	5,292	37,758
Keyword: Opioid Antagonist					
Total activities[a]	n/a	n/a	18	22	40
Number of pharmacists[b]	n/a	n/a	507	1,356	1,863
Total unique activities[c]	249	297	349	342	1,237

[a]Total number of activities listed in ACPE-extracted keyword data

[b]Total number of pharmacists may not represent unique learners and number of pharmacists is a cumulative number from year to year. If a program was offered in 2014 and still available in 2015, pharmacists who completed the program are included in the pharmacist count for 2015.

[c]A program may have had more than one keyword so total unique activities represents unique activities across key words.

Table 2. Keyword Contact Hour and Activity Type Data

Keyword	Average Number of Contact Hours	Home Study Activity[a]; n (%)	Live Activity[b]; n (%)	Knowledge Based Activity[c]; n (%)	Application Based Activity[d]; n (%)
Opiates	2.06	9 (14.5)	53 (85.5)	57 (92)	5 (8)
Opioids	1.52	72 (12.8)	490 (87.2)	506 (90)	56 (10)
Pain	1.7	34 (11.3)	267 (88.7)	269 (89.4)	32 (10.6)
Pain management	1.7	58 (11.9)	429 (88.1)	403 (82.8)	84 (17.2)
Drug overdose	1.65	35 (11.7)	126 (78.3)	135 (83.9)	26 (16.1)
Opioid Antagonist	1.63	6 (15)	34 (85)	32 (80)	8 (20)

[a]Accreditation Council for Pharmacy Education (ACPE) defines home study activities as enduring materials that are printed, recorded or computer assisted instructional materials that do not provide for direct interaction between faculty and learners.
[b]ACPE defines live activities as those that provide for direct interaction between faculty and learners and may include lectures, symposia, live teleconferences, workshops, etc.
[c]ACPE defines knowledge-based CPE activities as being primarily constructed to transmit knowledge (ie, facts). The minimum amount of credit for these activities is 15 minutes or 0.25 contact hour.
[d]ACPE defines application-based CPE activities as being primarily constructed to apply the information learned in the time allotted. The minimum amount of credit for these activities is 60 minutes or 1.0 contact hour.

Table 3. Summary of Content Analysis of Program Titles to Describe Frequency of Topic Areas among Keywords

	Year			
Topic Area	**2015**	**2016**	**2017**	**2018**
Keyword: Opiates				
Addiction/drug abuse	3	2	4	3
Naloxone[a]	1	3	1	0
Opioids[b]	4	4	3	10
Pain management	6	2	2	5
Other[f]	3	1	5	12
Keyword: Opioids				
Addiction/drug abuse	8	13	17	12
Naloxone[a]	7	13	12	29
Opioids[b]	30	55	84	109
Pain management	16	17	32	20
Other[f]	4	15	22	63
Keyword: Pain				
Addiction/drug abuse	2	3	2	3
Condition specific[c]	8	18	7	22
Practice setting specific[d]	6	10	8	2
Pain management	36	32	25	28
Other[f]	10	6	10	5
Keyword: Pain Management				
Addiction/drug abuse	6	5	5	2
Condition specific[c]	34	28	29	13
Medication specific[e]	3	10	8	1
Opioids[b]	18	23	17	5
Pain management	57	59	51	24
Practice setting specific[d]	13	1	7	5
Other[f]	20	13	11	5
Keyword: Drug Overdose				
Addiction/drug abuse	2	5	3	3
Naloxone[a]	2	9	12	4
Opioids[b]	2	1	9	7
Overdose	0	5	2	6
Other[f]	13	7	7	7
Keyword: Opioid Antagonist				
Addiction/drug abuse	n/a	n/a	1	2
Naloxone[a]	n/a	n/a	3	6
Opioids[b]	n/a	n/a	1	4
Other[f]	n/a	n/a	0	17

a=Naloxone includes harm reduction
b=Opioids includes opioid withdrawal, opioid epidemic, opioid toxicity

c=Condition specific includes back pain, cancer, geriatrics, neuropathic pain, migraine, acute pain, post-surgical
d=Practice setting specific includes community, palliative care, hospice, post-surgical, ICU, primary care, ED, long term care
e=Medication specific includes ketamine, methadone, marijuana, controlled substances
f=Other includes law, medication assisted treatment, opioid use disorder, overdose prevention, drug diversion, patient safety, prescription monitoring program