

## BRIEF

# Comparing Data Submitted by Public and Private Pharmacy Schools to the Opioid-Related Activities Database

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**Objective.** This investigation compared similarities and differences in education on opioids and opioid abuse between public and private US schools and colleges of pharmacy.

**Methods.** The American Association of Colleges of Pharmacy has created and maintains an Opioid-Related Activities database for schools and colleges of pharmacy in the United States. With data from 2019, a mixed-methods design was used to triangulate quantitative analysis with a concurrent qualitative analysis. After describing, the data were compared to national statistics of schools and colleges of pharmacy (ie, number, type of school, and program structure). Data from the database on opioid activity types (ie, education, service, practice, research, and advocacy) were compared between private and public institutions, both quantitatively and qualitatively. The quantitative analysis used odds-ratios (for effect-size) and chi-square (for statistical significance), while the qualitative analysis employed word clouds to explore opioid-related activities descriptors.

**Results.** One-hundred-seven of 144 US schools and colleges of pharmacy (74% response rate) provided their opioid-related activities information to AACP. The institutions (55 private, 52 public) had entered 436 unique opioid-related activities in the AACP database. Results of the quantitative and qualitative analyses triangulated that private institutions focused more on education-opioid-related activities, while public institutions offered more activities that involving research. Magnified to education-type opioid-related activities, faculty from private institutions often focused narrowly on an education event alone, while faculty from institutions often focused more broadly on education and other aspects such as funding, research and published articles.

**Conclusion.** Overall, private and public US schools and colleges of pharmacy widely engaged in combatting the US opioid epidemic by training student pharmacists in this important area.

**Keywords:** opioid education, database, pharmacy education, public, private

## INTRODUCTION

Public and private institutions are the two major types of US schools and colleges of pharmacy. Many times, national pharmacy education surveys denote whether the responding institutions are public or private and compare whether there are differences between them based on that variable. For example, Glover and Deziel-Evans described the responsibilities of tenure-track vs non-tenure-track pharmacy practice faculty at US pharmacy schools and then compared faculty roles between private and public schools.<sup>1</sup> However, in other surveys, comparisons made between private and public pharmacy schools seem to have been conducted as a secondary (incidental) analysis

just because the data were available. That said, describing the number of private and public pharmacy schools in a sample can be important in terms of the generalizability of the authors' findings.

We found only one study where institution type was the investigation focus (as opposed to a secondary/incidental comparison).<sup>2</sup> Therein, investigators obtained and analyzed attributes of US schools and colleges of pharmacy. However, the study did not look at the schools' educational offerings (ie, end products). We are not aware of any study to date that has compared educational offerings between public and private US schools and colleges of pharmacy. Thus, we investigated educational offerings that targeted the US opioid epidemic.

The term *opioid epidemic* stemmed from an abnormal surge in opioid overdose deaths from 1990-2017<sup>3</sup> along with an increased number of prescription for opioids over that time.<sup>4</sup> This necessitated a need to educate pharmacists

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and student pharmacists about this topic. Consequently, US pharmacy schools provide opioid-related activities to help educate their student pharmacists about the opioid epidemic in the United States. The objective of this investigation was to compare and contrast the opioid-related educational activities (end products) offered at public vs private US schools and colleges of pharmacy.

## METHODS

Our overall study design used a mixed-methods approach that involved triangulating a quantitative analysis with a concurrent qualitative analysis. We first analyzed the Opioid-Related Activities database ([www.aacp.org/opioid](http://www.aacp.org/opioid)) collated by the American Association of Colleges of Pharmacy (AACP). Starting in July 2018 (and following multiple email requests), AACP invited faculty at US schools and colleges of pharmacy to catalogue ORAs in what would be an ongoing (continuously updated) database. The AACP categorized opioid-related activities into five types: education, research, service, practice, and advocacy.<sup>5</sup> Each activity type was also described further with a number of descriptive tags, which AACP grouped into thematic categories.<sup>6</sup> A full description of the database is forthcoming (personal communication, DJ Venricelli, July 17, 2020). Our investigation focused on and delimited to comparing private and public schools and colleges of pharmacy.

While data submission to the AACP's database is ongoing, we downloaded its contents on January 30, 2020. Participating pharmacy schools were described according to institution type (private, public), program structure (traditional/four-year, accelerated/three-year), and US region (based on US Census Bureau's classifications). For generalizability, these sample characteristics were compared to current national numbers of US schools and colleges of pharmacy.<sup>7</sup>

A faculty-member at each of the pharmacy schools represented in AACP's database had coded their opioid-related activities using definitions and a codebook for database-inputters developed by AACP.<sup>8</sup> For opioid-related activities types, we arranged the activity types (education, practice, service, advocacy, and research) into five separate columns, entering a yes or no response for each activity type. The activity types were not mutually exclusive of one another; one activity could be catalogued with more than one activity type.

After the contributor had identified the type of opioid-related activity, they had been asked to select one or more of 59 descriptive tags to explain the activity in further detail. For example, an educational opioid-related activity could be further described by adding tags such as "continuing

education," "elementary school student," "experiential," and/or "opioid prescribing."

The AACP had previously assigned one or more of 59 descriptive tags from eight thematic categories: education, treatment, community-service, partnership, health-care professionals, regulations, funding, and research.<sup>6</sup> For example, if an activity had been tagged with "continuing education," "elementary school student," "experiential," and/or "opioid prescribing," it had been classified into the thematic category "education." Thus, we created eight columns in our database for the thematic categories along with a yes/no column.

For quantitative analysis, the opioid-related activity types and thematic categories were compared between private and public schools and colleges of pharmacy. Odds ratios were used to describe the effect size for comparisons, while chi-square tests (and Fisher exact tests for small samples) were used to determine statistical significance. Thirteen chi-square tests were performed *a priori*; private vs public across all opioid-related activity types (five tests), and private vs public across all thematic categories (eight tests). Similar to a Bonferroni adjustment, a more precise Holms adjustment was made for multiple comparisons. Further, a Mann-Whitney U test was used to compare the number of simultaneous opioid-related activity types coded for each opioid-related activity, between public and private institutions. Additionally, given the number of newer accelerated (three-year) PharmD programs,<sup>2</sup> we performed five Fisher-exact tests in which each of the five activity types were compared between accelerated (three-year) and traditional (four-year) PharmD programs. (We hoped these exploratory comparisons might provide further details about program structures at various US schools and colleges of pharmacy.) This quantitative analysis used SPSS, version 26 (IBM).

For the qualitative analysis, faculty at each pharmacy school had also coded their opioid-related activities with descriptive tags. We collated these descriptive tags and placed them into word clouds<sup>9</sup> to further describe qualitatively the types of activities provided by schools and colleges of pharmacy. Using [www.wordclouds.com](http://www.wordclouds.com), we generated word clouds for both private and public institutions.

## RESULTS

Of 144 accredited US schools and colleges of pharmacy at the time the data were downloaded in 2020, 107 had entered their data into the AACP's Opioid-Related Activities database (74% response rate). Fifty-five (52%) private and 52 (48%) public schools and colleges of pharmacy were represented in the database; compared with

51% private and 49% public schools and colleges of pharmacy in 2020.<sup>7</sup> From the database, 38 schools and colleges of pharmacy were from the South (36%), 28 from the Midwest (26%), 19 from the Northeast (18%), and 22 were from the West (20%); compared with 39% of schools and colleges of pharmacy from South, 33% from Midwest, 18% from Northeast and 20% from West in 2020.<sup>7</sup> Furthermore, there were 94 traditional (four-year) and 13 accelerated (three-year) PharmD program structures in this database sample.

The 107 schools and colleges of pharmacy provided 436 opioid-related activities. Of those, 283 were education related, 109 were research related, 105 were service related, 32 were practice related, and 16 were advocacy related. A comparison of the various activity types at private and public schools and colleges of pharmacy is shown in Table 1. The private institutions focused on education-related activities (odds ratio=0.5, 95% CI 0.34-0.76;  $p<.05$ ), while public institutions included more research-related activities (odds ratio=2.5, 95% CI 1.48-4.29;  $p<.05$ ).

More opioid-related activities were singly-coded (eg, education) by faculty at private pharmacy schools, while more opioid-related activities were multiply-coded (eg, “education” and “research” for the same activity) by faculty at public pharmacy schools. While the medians were the same for private and public at one type coded per opioid-related activity, interquartile ranges (and distributions) differed between private institutions (interquartile range of

zero) and public institutions (interquartile range of one;  $p=.002$  by Mann-Whitney U). That is, more opioid-related activities at public institutions, as compared to private institutions, were simultaneous coded for multiple opioid-related activity types.

Among the thematic categories, there were 281 descriptive tags for education, 275 for treatment, 193 for community service, 158 for partnership, 147 for healthcare professionals, 156 for regulation, 155 for funding, and 81 for research. The odds ratios for thematic categories of opioid-related activities are reported in Table 1. After Holm-adjustment, the research-related and funding-related thematic categories were statistically more common at public institutions, while education-related thematic categories were more common at private institutions.

Further, we compared program structure (traditional versus accelerated). How various opioid-related activities compared between traditional (4-year) and accelerated (3-year) program structures are shown in Table 2. As seen, only the research type of opioid-related activities was more likely to be offered in a traditional program than in an accelerated program (OR=0.3;  $p<.05$ ). This finding was significant; however, a significant difference was not found between public and private accelerated (3-year) programs (although there were a very small number of accelerated public PharmD programs in this sample).

Table 1. Comparison of Opioid-related Activities Offered by US Schools and Colleges of Pharmacy

	Private Institution	Public Institution	Odds-Ratio (95% CI) [Private:Public]
<b>Type of Opioid- Related Activities</b>			
Education	142	141	0.5 (0.34-0.76) <sup>a</sup>
Practice	12	20	1.4 (0.65-2.86)
Service	37	68	1.7 (1.05-2.61)
Advocacy	5	11	1.8 (0.61-5.27)
Research	31	78	2.5 (1.56-3.99) <sup>a</sup>
<b>Thematic Category of Opioid-Related Activities</b>			
Education	139	142	0.6 (0.37-0.84) <sup>a</sup>
Treatment	123	152	0.9 (0.65-1.44)
Community-service	86	107	1.0 (0.68-1.45)
Partnership	70	88	1.0 (0.68-1.5)
Healthcare-professionals	62	85	1.1 (0.77-1.72)
Regulation	62	94	1.3 (0.9-2.01)
Funding	55	100	1.8 (1.18-2.66) <sup>a</sup>
Research	22	59	2.5 (1.48-4.29) <sup>a</sup>

<sup>a</sup> Chi-square,  $p<.05$ ; Holm-adjusted for repeated comparisons

Data Source: AACP Opioid-Related Database

Table 2. Comparisons of Opioid-Related Activities Offered by US Schools and Colleges of Pharmacy

Types of Opioid-Related Activity	PharmD Program Structure		Odds-Ratio (95%CI) [4-year:3-year]
	Traditional 4-year	Accelerated 3-year	
Education	258	25	1.5 (0.7-3.4)
Service	96	9	1.1 (0.5-2.5)
Practice	30	2	0.8 (0.17-3.3)
Advocacy	15	1	0.8 (0.1-6.1)
Research	106	3	0.3 (0.08-0.9) <sup>a</sup>

<sup>a</sup> Fisher exact test,  $p < .05$

Data Source: AACP Opioid-Related Database

Our word cloud results showed similarities and differences in descriptors for opioid-related activities. As in Figure 1, word clouds from private and public institutions had different numbers of opioid-related activities. (Therefore, interpretation should be done *within* word clouds, instead of comparing between the word clouds.) Among private institutions, the most often used terms were “student pharmacist” followed by “Substance use disorder.” Among public institutions, these descriptors were also most common, but were smaller in size versus other words in the public institution word cloud. Although “funding,” “peer-reviewed,” and “published articles” were in both word clouds, they were notably larger compared to other words for public institutions. Appendix 1 provides further word clouds for each type of opioid-related activity separately. These qualitative findings agree and triangulate with the quantitative analysis results above.

## DISCUSSION

From the 107 US schools and colleges of pharmacy that submitted data regarding opioid-related activities within their PharmD curriculum to the AACP database, we observed similarities and differences between public and private institutions. Three results stand out. First, both quantitative and qualitative analyses showed significant differences between the two institution types. Private pharmacy schools had slightly more education opioid-related activities (142 vs 141) while public pharmacy schools had more research opioid-related activities conducted (78 versus 31). This is expected, as private institutions have (almost exclusively) a tuition-based institutional revenue stream, with student pharmacist education as their central focus. Alternatively, public institutions usually have other revenue streams, including public and research/grant funding, but also have competing priorities. Second (and most notable), public and private schools and colleges of pharmacy had *similar* numbers of education-type opioid-related activities,

while public institutions also had more other opioid-related activity types. Faculty at public institutions more often squeezed more types of learning into a single opioid-related activity (eg, education and research, education and advocacy, and service and advocacy, compared to education alone). To this end, faculty at private pharmacy schools should consider broadening their educational programming focus, to also include opioid-related activity types beyond education integrated in what they are already doing. Third, we showed that regardless of whether a school was private or public, research opioid-related activities were significantly more common among traditional (four-year) programs than accelerated (three-year) programs.

Through this case-study of opioid-related activities, we highlight some of the similarities and differences in educational products from private and public schools and colleges of pharmacy. While some prior studies have shown differences between public and private schools and colleges of pharmacy,<sup>1,2</sup> this appears to be the first study to systematically describe differences in actual output of an educational offering (ie, opioid-related activities). As noted in this article’s introduction, a prior study identified differences in other attributes of public and private schools and colleges of pharmacy, such as a higher number of public institutions with PhD enrollees.<sup>2</sup> This is one potential reason for the larger number of opioid-related activities related to research in public institutions.

Along with differences between public and private institutions, we explored the differences in opioid-related activities between traditional (four-year) and accelerated (three-year) PharmD programs. Ford<sup>10</sup> investigated pharmacist licensure examination (an educational outcome) between these PharmD program structures but found no differences. Meanwhile, this study of opioid-related activities *did* identify one notable difference: research. The overall lack of differences in educational products on opioids should be reassuring for newer accelerated (three-year) PharmD programs.

**Private (n=195 ORAs)**

**Public (n=243 ORAs)**



Figure 1. Word clouds of descriptive tags for opioid-related activities at private and public US schools and colleges of pharmacy created from 2020 data submitted to the opioid-related activities database set up by the American Association of Colleges of Pharmacy

This study has four notable limitations, with the first two relating to the AACP’s database. First, the comprehensiveness of the database was limited by participation from voluntary faculty as coders at each school. Also, database contributors may have interpreted codes differently despite instructions as well as database categories and descriptors.<sup>8</sup> For instance, an opioid-related activity may have been coded only as education but may have included practice such as experiential participation by students (so could have been multiply-coded), or been categorized only as practice even though a few students on rotation participated (and could have been multiply-coded with education). That is, this database relied on faculty members to accurately interpret and consistently and correctly enter information into the database about the opioid-related activities included in their school’s curriculum. Second, while AACP requested participation via emails and face-to-face (at the 2019 AACP Annual Meeting) for information on learning activities at their school related to opioids to this database, the contents that we searched did not appear to fully represent all opioid-related activities conducted at all US schools and colleges of pharmacy. However, the high (74%) response rate among US schools and colleges of pharmacy to AACP’s request and the close similarity between this database and national institutional data, seem sound as evidence supporting the generalizability of these findings. Third, we were only able to compare the quantity (rather than the quality) of the opioid-related activities reported. Other than the frequency of descriptive tags in our qualitative

analysis, we did not investigate the quality of opioid-related activities conducted by the schools and colleges of pharmacy further. With their narrower focus on education-type opioid-related activities, private institutions may have provided higher quality educational offerings than public institutions. Finally, we did not identify the size of the schools and colleges of pharmacy in the database, in an attempt to standardize (such as per faculty FTE) the number of opioid-related activities. Larger programs may offer more opioid-related activities, which could be worth further study.

**CONCLUSION**

American schools and colleges of pharmacy, regardless of whether private or public institutions, widely engage in the provision of opioid-related activities to combat the opioid epidemic in the United States. More specifically, opioid-related activities at private schools and colleges of pharmacy appear to be more focused on education of student pharmacists, while public schools and colleges of pharmacy offer more opioid-related activities, including more research opioid-related activities. Triangulation between quantitative and qualitative findings showed similar patterns between private and public schools and colleges of pharmacy. Additionally, faculty at private schools may benefit from professional development targeting integrating research and other activities (eg, service, advocacy, practice) alongside educational activities to fulfill other responsibilities of a faculty member.

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Appendix 1. Word Clouds of Descriptive Tags for Each Opioid-Related Activity Type Among Private and Public Institutions

