

**BRIEF****Comparing Private and Public Colleges/Schools of Pharmacy: A Case-Study Using Opioid-Related Activities**

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**Objective.** This investigation was a case-study example of similarities and differences in educational offerings between public and private US colleges/schools of pharmacy (C/SOPs). It focused on opioid-related activities (ORAs) for the US Opioid Epidemic, with an objective to compare ORAs (educational products) between public and private institutions.**Methods.** An ORA database for US C/SOPs was collated by the American Association of Colleges of Pharmacy. In a mixed-method study design, this study triangulated a quantitative analysis with a concurrent qualitative analysis. After describing institutions in our sample and comparing those to national statistics, we compared ORA types (education, service, practice, research, and advocacy) between private and public institutions both quantitatively and qualitatively. Our quantitative analysis used odds-ratios (for effect-size) and chi-square (for statistical significance), while our qualitative analysis employed word-clouds to explore ORA descriptors.**Results.** One-hundred-seven C/SOPs (74% response-rate) were included. The institutions (55 private, 52 public) provided 436 unique ORAs. Quantitatively, significant odds-ratios were found for both private and public institutions.

Qualitatively, word-clouds of ORA descriptors illustrated similarities and difference between private versus public institutions; this triangulated/agreed with quantitative findings.

**Conclusion.** Overall, private and public C/SOPs widely engaged with the US Opioid Epidemic through a variety of ORAs. Quantitative and qualitative analysis triangulated/agreed that private institutions focused more on education-ORAs, while public institutions offered more ORAs beyond education including more research-ORAs. Of note, while faculty from private C/SOPs were more focused only on education, faculty from public C/SOPs more often focused on other additional aspects for an education-related ORA.**Keywords:** opioid education, database, pharmacy education, public, private**INTRODUCTION**

Public and private are the two major institution types for US colleges/schools of pharmacy (C/SOPs). Often, national surveys of US C/SOPs denote these, and among other intentions, compare whether there is a difference between them on that survey topic. For example, responsibilities of tenure-track versus non-tenure-track pharmacy practice faculty were described for US C/SOPs; faculty roles were compared between private versus public C/SOPs.<sup>1</sup> However, many other times in other surveys, comparisons of private versus public C/SOPs seem a secondary (incidental) analysis ‘just because the data were available.’ (That said, it can be important to describe the number of private and public C/SOPs in the sample, as evidence for generalizability with the larger population of US C/SOPs.)

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 for US C/SOPs (at that time). However, these attributes did not look at educational offerings (end-products). We are not aware of any study to date that has compared educational offerings between public versus private C/SOPs. Thus, we investigated educational offerings that targeted the US Opioid Epidemic.

Of note, the label ‘opioid epidemic’ stemmed from an abnormal surge in opioid overdose deaths in recent years,<sup>3</sup> along with an increased number of prescription of opioids over that time.<sup>4</sup> This necessitated a need to educate pharmacists and student pharmacists. Consequently, C/SOPs have provided opioid-related activities (ORAs) to help educate their student pharmacists about the US Opioid Epidemic. As a case-study example of educational offerings, the objective of this investigation was to compare and contrast ORAs (end-products) between public and private C/SOPs.

**METHODS**

Our overall study design used mixed-methods, triangulating quantitative analysis with a concurrent qualitative analysis. We analyzed the recent *Opioid-Related Activities* database ([www.aacp.org/opioid](http://www.aacp.org/opioid)) collated by the American Association of Colleges of Pharmacy (AACP).

From July 2018 (and following multiple email requests), AACP invited US C/SOP faculty to catalogue ORAs in this ongoing database. AACP categorized ORAs into five types (education, research, service, practice and advocacy).<sup>5</sup> Each ORA type was also described further with a number of descriptive tags, with these descriptive tags grouped by AACP into thematic categories.<sup>6</sup> Full description of this ORA database is forthcoming (personal communication, DJ Venricelli, July 17, 2020). Our current investigation was focused on and delimited to comparing private and public C/SOPs.

### *Participant Colleges/Schools of Pharmacy*

While this database remains on-going, we downloaded its contents on January 30, 2020. Participating C/SOPs in the database were described according to institution type (private, public), program structure (traditional/4-year, accelerated/3-year), and US region (using the US Census Bureau's classifications). For generalizability, these sample characteristics were compared to current national numbers of US C/SOPs.<sup>7</sup>

### *Opioid-Related Activities*

A faculty-member at each C/SOP coded their ORA(s) into AACP's database using definitions and a codebook for database-inputters that AACP developed.<sup>8</sup>

**Opioid-Related Activity Types.** We arranged the ORA types (education, practice, service, advocacy, and research) into five separate columns, with yes/no for each ORA type. Notably, these ORA types were not mutually exclusive of one another; one ORA could be catalogued with more than one ORA type.

**Descriptor Tags.** After ORA type was identified for each coded activity, it was explained in further detail using one or more of 59 descriptive tags. For example, an education ORA could be further tagged with 'continuing education', 'elementary school student', 'experiential', and/or 'opioid prescribing'.

**Thematic Categories.** Eight thematic categories (education, treatment, community-service, partnership, health-care professionals, regulations, funding, and research) had been previously assigned for the 59 ORA descriptive tags.<sup>6</sup> For example, if an ORA was tagged with 'continuing education', 'elementary school student', 'experiential', and/or 'opioid prescribing', it would be classified into the thematic category 'education'. Thus, eight columns were arranged for the thematic categories with yes/no for each column.

### *Data Analysis*

For quantitative analysis, the ORA types and thematic categories were compared between private and public C/SOPs. Odds-ratios were used to describe the effect-size for comparisons, while chi-square tests (and Fisher's exact tests for small samples) provided statistical significance. Thirteen chi-square tests were performed *a priori*; private vs public across all ORA types (5 tests), and private vs public across all thematic categories (8 tests). Similar to a Bonferroni-adjustment, a more precise Holms-adjustment was made for multiple comparisons. Post-hoc, a Mann-Whitney U was used to compare the number of simultaneous ORA types per activity, between public versus private C/SOPs. Additionally, as post-hoc and given the number of newer accelerated (3-year) PharmD programs,<sup>2</sup> we performed five Fisher-exact tests, in which each of the five ORA types were compared between accelerated (3-year) and traditional (4-year) PharmD program structures. (We hoped these exploratory comparisons might shed further detail on program structures at various US C/SOPs.) This quantitative analysis used SPSS, version 26 (IBM, Armonk, NY).

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

## **RESULTS**

Of 144 US C/SOPs (at time of download),<sup>8</sup> 107 C/SOPs participated in AACP's ORA database (74% response rate).

### *Institution Types*

There were 55 (52%) private and 52 (48%) public C/SOPs in this database; compared with 51% private and 49% public C/SOPs in 2020.<sup>7</sup> In this database, 38 C/SOPs 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% C/SOPs from South, 33% from Midwest,

18% from Northeast and 20% from West in 2020.<sup>7</sup> Furthermore, there were 94 traditional (4-year) and 13 accelerated (3-year) PharmD program structures in this database sample.

### Quantitative Analysis

**Opioid-Related Activities Types.** The 107 C/SOPs provided 436 different ORAs. Of those ORAs, 283 were education-related, 109 were research-related, 105 were service-related, 32 were practice-related, and 16 were advocacy-related. Table 1 shows how various ORAs types compared between private and public C/SOPs. The private institutions were focused on education-related ORAs (odds-ratio= 0.5;  $p<.05$ ), while public institutions offered ORAs including more research-related ORAs (odds-ratio=2.5;  $p<.05$ ).

Additionally, Table 1 shows statistical comparison of the number of ORA types per ORA. The Mann-Whiney-U was significant ( $p=.002$ ). That is, ORAs from public institutions had more multiple ORA types than did ORAs from private institutions. For instance, more ORAs were singly-coded (eg, 'education') by private C/SOP faculty while more ORAs were multiply-coded (eg, 'education' and 'research') by C/SOP institution faculty.

**Thematic Categories of Opioid-Related Activities.** Among 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. Also in Table 1, odds-ratios for Thematic Categories of ORAs are reported. 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.

**PharmD Program Structures.** As a post-hoc analysis, we also compared program structure (traditional versus accelerated). Table 2 shows how various ORAs compared between traditional (4-year) and accelerated (3-year) program structures. As seen, only the research type of ORA is more likely to be offered in traditional program than in accelerated program (OR=0.3;  $p<.05$ ). The finding was statistically significant however, this significance 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).

### Qualitative Analysis

Our word-cloud results showed similarities and differences in ORA descriptors. As in Figure1, word-clouds from private and public institutions had different numbers of ORAs. (Therefore, interpretation should be done *within* word-clouds, instead of comparing between the world-clouds.) Among private institutions, the most commonly used (and so largest) words 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. The Appendix provides further word-clouds for each type of ORA separately. These qualitative findings agree and triangulate with the quantitative analysis results above.

## DISCUSSION

From the 107 US C/SOPs in this AACP database, we observed similarities and differences in ORAs between public versus private C/SOPs. Three results stand out. First, both quantitative and qualitative analyses show significant differences between institution types for education ORAs and research ORAs. 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 can have other revenue streams, but with competing priorities including public and research/grant funding. Second (and most notable), public and private C/SOPs had *similar* numbers of education ORAs, though the public institutions had more other ORA types as well. Faculty at public institution more often squeezed further ORA types from the same activity (eg, education *and* research, education *and* advocacy, service *and* advocacy compared to education alone). To this end, faculty at private C/SOP may possibly benefit from mentoring to broaden their educational programming focus, to also include ORA types beyond education integrated in what they are already doing. Third, we also showed that regardless of private or public C/SOP, research ORAs were significantly greater among traditional (4-year) program structures versus accelerated (3-year) program structures.

Herein, we provide an example, through case-study of ORAs, of similarities and differences in educational products from private and public C/SOPs. While some prior studies have shown differences between public and private C/SOPs,<sup>1,2</sup> this appears to be the first study to systematically describe differences with an actual output of educational offering (ie, ORAs). As noted in this article's introduction, a prior study had shown differences in other C/SOP attributes such as a higher number of public institutions with PhD enrollees.<sup>2</sup> (This is one potential reason for the larger number of research ORAs we found for public institutions.)

Along with the public/private institutions differences, we explored the differences among traditional (4-year) and accelerated (3-year) PharmD program structures. Ford<sup>10</sup> importantly investigated pharmacist licensure examination (an educational outcome), finding no differences between these PharmD program structures. Meanwhile, this study of ORAs *did* show one notable difference (research); though other ORA types were not different. Lack of differences for these educational products may be reassuring for newer accelerated (3-year) PharmD programs.

We report four notable limitations, with the first two limitations of the study coming from AACCP's database. First, it was limited by voluntary participation from database-coders at each C/SOP, as well as potentially different interpretation of codes by those database-inputters. This database relied on numerous outside faculty to accurately interpret and consistently code their various ORAs into this database. Second, while AACCP requested via emails and face-to-face (at the 2019 AACCP Annual Meeting) for faculty to provide ORA information to this database, this database was unlikely to have included every ORA by all US C/SOPs. However, the high (74%) response rate among US C/SOPs and close similarity between this database and national institution data, seem sound as evidence towards generalizability of these findings. Third, we mainly compared quantity (versus quality) of ORAs. Other than the frequency of more detailed descriptors in our qualitative analysis, we did not investigate quality of ORAs further. Fourth and lastly, we did not further identify the size of the C/SOPs, in an attempt to standardize (such as per faculty FTE) the number of ORAs. It may be that larger programs offered more ORAs, which could be worth further study.

## CONCLUSION

American C/SOPs, regardless of private or public, widely engaged in the US Opioid Epidemic. More specifically, ORAs at private C/SOPs appeared more focused on education of student pharmacists, while public C/SOPs offered more ORAs including more research-ORAs. Triangulation between quantitative and qualitative findings showed similar patterns between private and public C/SOPs. Additionally, faculty from private schools may require professional development on how educational activities can be considered to fulfill other responsibilities of a faculty member.

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Table 1. Comparison of Institution Type (Private/Public) with Types of Opioid-Related Activities, with Thematic Categories of Opioid-Related Activities, and Number of Types per Opioid-Related Activity

	<b>Private Institution</b>	<b>Public Institution</b>	<b>Odds-Ratio (private:public)</b>
<b>Type of Opioid-Related Activities</b>			
Education	142	141	0.5*
Practice	12	20	1.4
Service	37	68	1.7
Advocacy	5	11	1.8
Research	31	78	2.5*
<b>Thematic Category of Opioid-Related Activities</b>			
Education	139	142	0.6*
Treatment	123	152	0.9
Community-service	86	107	1.0
Partnership	70	88	1.0
Healthcare-professionals	62	85	1.1
Regulation	62	94	1.3
Funding	55	100	1.8*
Research	22	59	2.5*
<b>Number of Types coded per Opioid-Related Activity</b>			
	1.00 (IQR 0)	1.00 (IQR 1)	.002†

\* Chi-square,  $p < 0.05$ ; Holm-adjusted for repeated comparisons

† Mann-Whitney U p-value

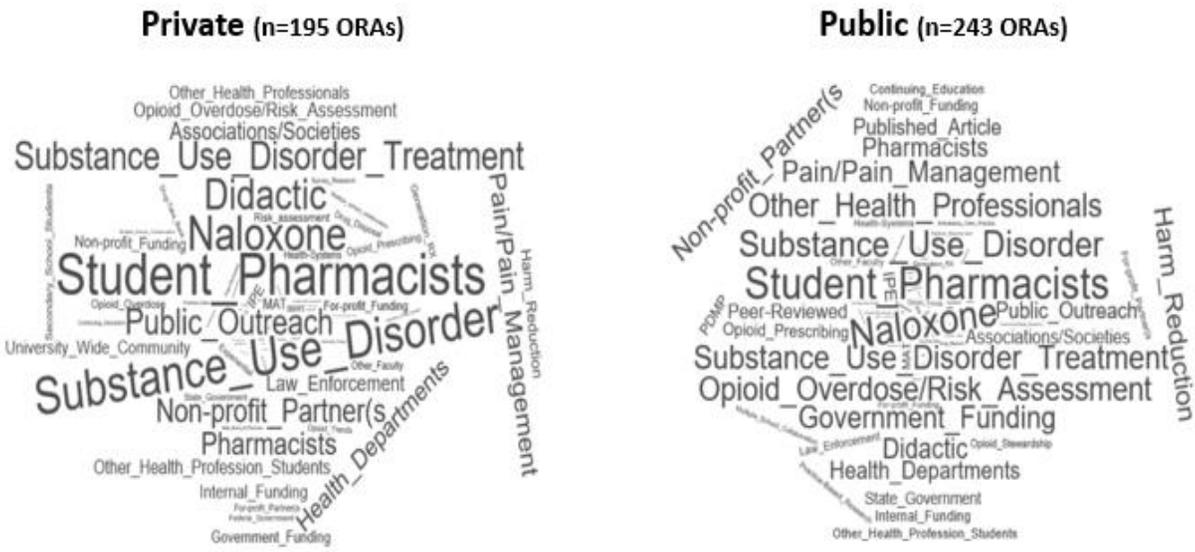
IQR=interquartile range

Table 2. Post-hoc comparisons of Opioid-Related Activities Type by PharmD program structure

	<b>PharmD Program Structure</b>		<b>Odds-Ratio (4-year:3-year)</b>
	<b>Traditional 4-year</b>	<b>Accelerated 3-year</b>	
<b>Types of Opioid-Related Activities</b>			
Education	258	25	1.5
Service	96	9	1.1
Practice	30	2	0.8
Advocacy	15	1	0.8
Research	106	3	0.3 <sup>a</sup>

<sup>a</sup> Fisher's Exact,  $p < .05$

Figure 1. Word-clouds of Descriptive Tags for Opioid-Related Activities Among Private and Public Colleges/Schools of Pharmacy



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