RESEARCH

Introducing Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, Others (LGBTQIA+) Patient Care Through Laboratory-Based Exercises

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Objective. To assess the impact on first-, second-, and third-year pharmacy students' confidence and knowledge in Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, and Others (LGBTQIA+) patient care in a novel skills laboratory setting.

Methods. Students were provided an LGBTQIA+ lecture containing pronouns, common terminology, health disparities, health screenings, and gender-affirming hormone therapy. During laboratory sessions, students engaged in a learning level-specific activity to apply lecture topics. Students completed a pre- and post-survey assessing their knowledge, confidence, and activity experience.

Results. All students (n=348) completed pre- and post-surveys, with a response rate for both of 79%. Overall increase in knowledge scores was statistically significant, with improvement in four out of six questions among each cohort. Students' understanding of the role of the pharmacist and confidence in caring for LGBTQIA+ patients showed a statistically significant increase, as did their comfort with using appropriate terminology. Most students (92%) agreed or strongly agreed that learning about the care of LGBTQIA+ patients was a positive experience, while 74% agreed additional education on LGBTQIA+ patients is still needed within their pharmacy curriculum.

Conclusion. From this brief exposure within a skills laboratory course, students' knowledge and confidence in caring for LGBTQIA+ patients improved, however, students agreed that more exposure is necessary. Future studies will follow students as they progress through the curriculum to determine the impact of exposure across all three didactic years.

Keywords: LGBTQIA, pharmacy curriculum, skills laboratory

INTRODUCTION

The Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, and Others (LGBTQIA+) community face many health care barriers, including practitioners' inexperience or discomfort in treating LGBTQIA+ patients.^{1,2} These barriers can lead LGBTQIA+ patients to avoid seeking out appropriate, routine health care and cause challenges with patient-provider relationship building.² One solution to these barriers is an increase in the number of health care providers who are competent and comfortable in serving the LGBTQIA+ community.³ The depth and breadth of LGBTQIA+ content in health science curricula vary. In 2014, the Association of American Medical Colleges (AAMC) took steps to encourage the development and further inclusion of LGBTQIA+ education in medical education through the development of an institutional guidance document encouraging the use of a variety of lectures and activities throughout the medical education curriculum.⁴ Curriculum mapping surveys of content related to LGBTQIA+ patients demonstrate limited coverage, if any, in most United States pharmacy schools.^{5,6} Within the American College of Clinical Pharmacy (ACCP) Pharmacotherapy Didactic Curriculum Toolkit, transgender health is considered a tier three topic, meaning students may not receive direct education or training during their didactic schooling, but instead are expected to obtain the required knowledge independently, and LGBTQIA+ health is not listed.⁷ Surveys of pharmacy students and recent graduates demonstrate a lack of confidence in their ability to care for LGBTQIA+ patients, particularly transgender patients, and support inclusion in the pharmacy school curriculum.^{1,8} A clear gap is present in pharmacy education related to ensuring graduates are competent and knowledgeable practitioners for LGBTQIA+ patients, and opportunity exists to provide quality education on this important patient population.^{1, 5, 6, 8, 9}

A review of published pharmacy education research in LGBTQIA+ topics shows current trends towards lecture-based content with a focus on cultural competency, terminology, and pronouns, alongside brief pharmacotherapy lectures utilizing case-based questions, panels, and patient stories.^{6, 8, 10-13} Interprofessional and elective courses present other

opportunities for including this topic into the curriculum.^{14, 16-18} Pharmacy students believe more than one lecture or activity is needed within required courses to gain knowledge and confidence in providing competent care for LGBTQIA+ patients.^{10-12, 14, 19} While current evidence of including LGBTQIA+ learning activities in a skills laboratory environment is minimal, nursing, medicine, and pharmacy education have successfully implemented hands-on activities to further apply LGBTQIA+ concepts to real-world scenarios, most commonly in the form of objective structured clinical exams (OSCE) with standardized patients.^{14, 15} Skills laboratory courses present flexibility in activity design and provide students with regular application of content and knowledge from a variety of courses. Thus, there exists an opportunity to provide LGBTQIA+ content throughout a pharmacy curriculum while providing hands-on application if included in skills-laboratory curricula.

In an effort to thread LGBTQIA+ content throughout the curriculum, activities were implemented into three skills laboratory courses for first-, second-, and third-year pharmacy students, which to our knowledge is a novel educational design. The objective of this pilot study was to assess the impact of these learning activities on students' confidence and knowledge in LGBTQIA+ patient care, as well as student perceptions of the activities.

METHODS

Virginia Commonwealth University (VCU) School of Pharmacy utilizes skills laboratories, termed Foundations, as six sequential courses to introduce first-, second-, and third-year Doctor of Pharmacy (PharmD) students to pharmacy practice in various settings. All students enrolled in a Foundations course during the 2019-2020 academic year attended an LGBTQIA+ lecture, synchronously or asynchronously, before their laboratory section containing pronouns, common terminology, health disparities, health screenings, and gender-affirming hormone therapy. As this was a pilot study, all three courses received the same lecture slide deck in their respective course so that the same survey could be given to each, but different portions were emphasized based on student level (Figure 1). First-year students' lecture focused on communication, whereas second-year students' emphasized health disparities and health screenings, both of which were a required 25-minute pre-class activity. Gender-affirming hormone therapy was the focus for third-year students given over a 30-minute live, in-person lecture prior to the activity.

After the lecture, students engaged in a learner-level-specific LGBTQIA+ activity. First-year students completed antibiotic counseling for a same-sex couple picking up for a pediatric patient with a gender-neutral name, with an emphasis on avoiding misgendering. This was followed by a class discussion hosted on an electronic polling system by the lecturer, who answered anonymous questions from students to prompt dialogue. Second-year students were given a married gay male patient case as part of a team activity focusing on asthma management. As part of the activity, students recommended health screenings for this patient using resources such as the United States Preventive Services Task Force (USPSTF) and University of California, San Francisco Transgender Care guidelines. The third-year activity was an at-home case assignment, which included drug therapy and counseling recommendations for transgender patients on hormone therapy. All skills laboratory activities were required, graded exercises in their respective courses. Institutions interested in providing this educational activity to their students are encouraged to reach out to the authors for collaboration and shared materials.

Students completed a voluntary pre- and post-activity survey assessing their knowledge, confidence, and activity perceptions. The survey was adapted, with permission, from Knockel and colleagues that assessed knowledge and comfort in caring for transgender patients.¹² The pre-activity survey included three questions to assess confidence in providing care for LGBTQIA+ patients on a five-point Likert scale and six true or false knowledge questions grouped into terminology (question 7), health screenings (question 4), health care disparities (questions 5 and 9), and pharmacotherapy (questions 6 and 8) (Table 1). The post-activity survey repeated the initial nine questions and added three Likert scale questions (Table 2) and two open-ended questions to assess student perceptions. Surveys were completed digitally or on paper, based on course coordinator needs; pre- and post-surveys were linked by participant-generated unique identifiers. Differences in responses from the pre- to the post-activity were evaluated using Wilcoxon Signed Rank tests for the Likert scale questions and two-sided paired t-tests for the dichotomous knowledge-based questions.

A latent class analysis (LCA) was conducted to characterize two open-ended questions in the post-activity, which assessed students' perceptions of the most and least helpful aspects of the skills laboratory-based exercises. The number of clusters identified for each question was selected based on the Bayesian Information Criterion (BIC), in which the smallest BIC measure of fit indicated the best latent cluster extraction. The top 10 terms for each cluster and associated scores were reported (Table 3), along with the corresponding multidimensional scaling (MDS) plots for each question. Additional description of the LCA findings has been provided with this link for interested faculty:

<https://www.dropbox.com/sh/wqj8y9bezn5aige/AACyy6DXowSUOMHufIJ0HwHBa?dl=0>. Statistical analyses were conducted using SAS, version 9.4, and open-ended response questions were analyzed through the Text Explorer module

of JMP Pro, version 14.^{20, 21} Statistical significance was evaluated with an alpha level set a priori at 0.05. This study was exempted from review by the university's Institutional Review Board.

RESULTS

A total of 294 students across three pharmacy classes completed at least one survey (348 students were present during survey administration, response rate = 84%). Of these 294 students, a total of 233 (79%) students completed both the pre- and post-activity survey. The first-year students had the highest response rate at 91%, while the second- and third-year students had a response rate of 73% and 75%, respectively.

Each pharmacy class demonstrated a significant increase in their overall knowledge score following the education intervention ($p < .001$), although not for each individual question (Table 1). All three confidence questions had significant increases for each pharmacy class (Table 1). Students responded positively to their perceptions of the activity (Table 2). Overall, 92% of students agreed it was a positive experience. When asked if the pharmacist's role was adequately introduced, 87% of students agreed and 74% agreed additional education is needed within their pharmacy curriculum. During the post-activity survey, "what was the MOST helpful/useful part of this activity?" had a meaningful student response rate of 79.8% (excluding responses that included not applicable or N/A). From these responses, a LCA showed two distinct clusters or themes for each open-ended question ($BIC_{Q13} = 5,948.90$, $BIC_{Q14} = 5,778.15$). The first cluster from question 13 encompassed terms referring to the presentation of materials, teaching atmosphere, and student's experience with the activity (Table 3). The second cluster encompassed terms referring to content of the skills laboratory-based exercises, how to best care for LGBTQIA+ patients, and how to address patients by their stated pronouns (Table 3). The question "what was the LEAST helpful/useful part of this activity?" had a meaningful response rate of 53.2%. The first cluster encompassed terms reflecting on how to better improve the survey and module in the future, often revolving around time. (Table 3). The second cluster reflected on ways to improve the content regarding information discussed via the in-person teachings as students found certain aspects of the material to be confusing, specifically the use of pronouns for children (Table 3).

Students' comments included how the videos highlighting the appropriate pronouns and terminology and health disparities of the LGBTQIA+ population were very helpful "because [we] were not aware of these concepts prior." Students enjoyed practicing asking for pronouns to create an inclusive environment. Numerous students expressed that the activity helped them grow in their awareness of the LGBTQIA+ community and it was necessary as health care professionals to "know this to be respectful if I were to have patients that go by another set of pronouns." Students also identified ways in which the lecture and activity could be improved. There were some conflicting comments regarding the timing of the lecture with comments such as "the pre-lab video was quite long," "we went over [the content] too quickly," and "there could have been more class discussion." Students' responses were also mixed regarding the content, with one student commenting that while they learned a great deal from the lecture and activity, they "were offended having to use a child as an example" and they "felt like it violated my religious beliefs about how [they] view children."

DISCUSSION

Third-year students had significant improvement with the terminology-focused question (question 7), while the other cohorts demonstrated nonsignificant improvement despite this being the emphasis placed on the first-year students. It is unclear why the health screening question (question 4) demonstrated a decrease in correct answers with first- and second-year students and a non-significant improvement among third-year students, as this was the second-year activity emphasis. It is possible introducing the second-year students to the health screenings tools at the same time as the LGBTQIA+ content led to this poor performance and more activities to practice health screening recommendations are needed. Health disparity-focused questions saw significant improvement for insurance coverage (question 9) among all cohorts and significant improvement among first-year students for unique health risks and needs (question 5). Wording of question five may have confused students, and intentions to avoid alienating any population could have led to selecting the incorrect answer, specifically for second-year students. In the future, this question will be updated to be more precise and include specific disparities. Interestingly, all cohorts had significant improvement in pharmacotherapy questions (questions 6 and 8), which were emphasized for only third-year students and despite the first- and second-year students only having a slight overview of therapy included in their lecture. Knockel and colleagues saw similar increases for pharmacotherapy knowledge-based questions.¹² This may speak to pharmacy students' focus and interest in therapeutics, separate from lecturer intentions.

Confidence questions showed significant increases for all cohorts. The role of the pharmacist in caring for LGBTQIA+ patients was not previously covered in the VCU curriculum, and this novel intervention led to increases in student self-reported understanding. Confidence in caring for LGBTQIA+ patients also significantly increased, which is affirmed in the significant improvement in therapy knowledge questions. Lastly, the increase in comfort towards using

appropriate terminology matches the increase in knowledge question performance. Previous didactic studies, limited to single cohort learner levels, demonstrated similar increases in knowledge and confidence questions.¹⁰⁻¹² Confidence or comfort in recognizing health disparities and recommending health screenings were not addressed in this pilot survey, but will be included in future versions.

Students found the delivery of information through a combination of lecture, videos, and hands-on class experiences to be most helpful in increasing their knowledge on the subject matter. This combination of activities aligns with the AAMC institutional guidance document, which emphasizes not only didactic teaching but multimodal learning to advance the health care of LGBTQIA+ patients.⁴ As for the content, students appreciated the content coverage and had a mixed assessment of the delivery timing for lecture and activity. Consistently students reported additional exposures were required, as seen with previous studies.^{10-12, 14, 19} As this was the first year of content, assistance from the students' responses on how the activity could be improved will be implemented in the future cohorts. Students' requests for additional exposures to LGBTQIA+ content will also be addressed as the students progress through the curriculum to find these activities within each laboratory year. One comment must be addressed as a student was offended by the material and their own religious beliefs. This student response has been discussed in previous literature as a suggested barrier for inclusion of LGBTQIA+ content in the curriculum, however, "religious beliefs should not interfere with competent patient care."¹¹

Most student comments focused on an improved patient counseling experience, asking for more practice utilizing appropriate pronouns and a more in-depth class discussion of how to best ask patients for their pronouns to reduce potential awkwardness. They also asked for the opportunity to counsel a transgender patient in-person rather a take-home assignment and to assess health screenings for a transgender patient. This suggests that this topic is important to teach synchronously with time for students to ask questions and practice patient counseling. Classroom discussions should allow anonymous questions to be asked, as seen in this study and in Parkhill and colleague's piece, through message boards or other asynchronous modalities.¹³ If this is not feasible, lecture content may be recorded and viewed asynchronously before completing the hands-on activities. If possible, a synchronous counseling session would be preferred so students can practice asking for appropriate pronouns with another person.

This pilot study was not without limitations. It was a one-year, first-time activity at a single institution without a control group, however, future studies will be able to assess students with multiple years of repeated activities within the program. True and false questions, while potentially faster for students to answer, may be less likely to reflect true knowledge and understanding.²² In future studies, knowledge questions will be redesigned to be specific and fill-in-the-blank or multiple-choice. There were only six total knowledge questions to keep the survey short, however, more questions are needed to determine the full impact of the intervention. The same questions on confidence and knowledge were used on the pre- and post-surveys to allow a direct comparison, leading to the potential for recall bias. Additionally, future studies could assess students' counseling in addition to their content knowledge, similar to Jann and colleagues and Greene and colleagues, with the addition of rubrics specially structured to capture components of LGBTQIA+ patient care.^{14, 15} Finally, fewer overall responses for the question on the least helpful aspects of the activity resulted in fewer frequency of terms, potentially impacting cluster analysis results.

Future cohorts will not receive the same slide deck, but instead, first-year students will receive a communication lecture, second-years a health disparities and screenings lecture, and third-years a gender-affirming hormone therapy lecture. Each cohort will also receive surveys individualized to the topic of the lecture for that year. This modification will decrease replication between the years while allowing exposure throughout the curriculum longitudinally. Students included in the pilot will have some repetition in material, but additional information will be included in the new lectures that they did not receive in the pilot. The activities in the skills laboratory courses will continue as developed from this pilot, with adjustments made as recommended by students and as required by limitations to in-person instruction. Including, offering synchronous counseling for third-year students and a discussion board for the first-year students. Additional studies will be conducted from a first-year cohort as they progress, assessing the impact of longitudinal curriculum inclusion of LGBTQIA+ content.

CONCLUSION

An introductory lecture and learning activity were successfully implemented in three skills laboratory courses. Overall, this study demonstrated an increase in knowledge and confidence in caring for LGBTQIA+ patients after a lecture and activity among first-, second-, and third-year students. Students' perceptions of the activity were overall positive. Many students agreed or strongly agreed that more than one exposure to this topic is necessary, and future research will continue to follow each cohort as they progress through the program. Skills laboratory courses over the duration of students' didactic education can provide an opportunity for students to be exposed to LGBTQIA+ related content throughout the curriculum and apply what they learn through hands-on activities.

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Figure 1. LGBTQIA+ Pharmacy Skills Lab Interventions by Student Cohort

Student Level	Pre-Lab Lecture Emphasis	Lab Activity
First-Year	Patient Communication	Antibiotic Counseling: Pronoun Use
Second-Year	Health Disparities and Screenings	Asthma Management: Health Screenings
Third-Year	Hormone Therapy	Hormone Therapy: Management and Counseling

Figure 1. Outline of the emphasis in the pre-laboratory Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, Others (LGBTQIA+) lecture and activity for each cohort. Communication and appropriate pronoun use were emphasized for first-year students, and they asked for pronouns in an antibiotic counseling activity. Health disparities and health screenings were emphasized in the lecture for second-year students, and they made appropriate health screening recommendations in an asthmatic patient case. Gender-affirming hormone therapy was the emphasis for third-year students, and they provided management and counseling recommendations for transgender patients in a take-home assignment.

Table 1. Average Confidence/Aptitude Scores and Knowledge Scores for Each Question on the Pre- and Post-Test by Pharmacy Class

	P1 Class (n = 87)			P2 Class (n = 64)			P3 Class (n = 82)		
	Pre-test, M (SD)	Post-test, M (SD)	p- value**	Pre-test, M (SD)	Post-test, M (SD)	p- value**	Pre-test, mean (SD)	Post-test, mean (SD)	p-value ^b
Confidence Questions^a									
1. I understand the role of the pharmacist in caring for LGBTQIA+ patients.	3.8 (1.07)	4.5 (0.87)	<.001	3.8 (0.97)	4.4 (0.77)	<.001	3.8 (0.78)	4.4 (0.51)	<.001
2. I feel confident in caring for LGBTQIA+ patients.	3.8 (1.08)	4.2 (0.82)	<.001	3.8 (0.96)	4.2 (0.72)	0.001	3.3 (0.99)	4.0 (0.68)	<.001
3. I feel comfortable using appropriate terminology when counseling LGBTQIA+ patients.	3.6 (1.12)	4.2 (0.90)	<.001	3.6 (0.95)	4.2 (0.89)	<.001	3.3 (0.96)	4.1 (0.65)	<.001
	Pre-test, % correct (SD)	Post-test, % correct (SD)	p- value[^]	Pre-test, % correct (SD)	Post-test, % correct (SD)	p- value[^]	Pre-test, % correct (SD)	Post-test, % correct (SD)	p- value[^]
Knowledge Questions									
Terminology Focused									
7. Gender-affirming language should be used in patient encounters.	67 (47)	76 (43)	0.10	53 (50)	64 (48)	0.09	54 (50)	76 (43)	<.001
Health Screening Focused									
4. Lesbian patients do not need Pap smears as frequently as heterosexual women.	93 (25)	86 [#] (35)	0.08	89 (31)	83 (38)	0.21	88 (33)	91 (28)	0.18
Disparity Focused									
5. LGBTQIA+ populations have unique health risks and health needs.	74 (44)	87 (33)	0.002	86 (35)	84 (37)	0.78	87 (34)	93 (26)	0.13
9. LGBTQIA+ patients are less likely to have health insurance than heterosexual patients.	24 (43)	61 (49)	<.001	31 (47)	67 (47)	<.001	41 (50)	61 (49)	0.004
Pharmacotherapy Focused									
6. Feminizing hormone therapy commonly includes both estrogen and an androgen blocker.	64 (48)	90 (31)	<.001	48 (50)	88 (33)	<.001	66 (48)	91 (28)	<.001
8. Initiation of gender-affirming hormone therapy first requires a psychological assessment.	11 (32)	41 (50)	<.001	16 (37)	41 (50)	<.001	15 (36)	33 (47)	<.001
Overall Knowledge Questions	56 (19)	74 (21)	<.001	54 (19)	71 (24)	<.001	58 (21)	74 (18)	<.001

^aConfidence with each statement indicated using a five-point Likert scale, with 5=strongly agree and 1=strongly disagree. #n=86 for question 4 of the post-test among the P1 cohort.

^bCalculated differences in mean scores between pre- and post-test using a Wilcoxon Signed Rank Test. [^]Calculated differences in % correct between pre- and post-test using a paired t-tests.

P1=first professional year; P2=second professional year; P3=third professional year; LGBTQIA+=Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, and Others

Table 2. Assessment of LGBTQIA+ Activity by Pharmacy Cohort

	P1 Class (n=87)					P2 Class (n=64)					P3 Class (n=82)					Total (n=233)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
Activity Question ^a																				
1. Learning about the care of LGBTQIA+ patients in class was a positive experience.	1	1	3	30	52	0	1	4	21	35	0	0	5	40	37	1	2	12	91	124
2. This program has adequately introduced the pharmacist's role in caring for LGBTQIA+ patients.	1	2	2	43	39	0	4	8	26	23	0	4	6	48	24	1	10	16	117	86
3. Additional education on LGBTQIA+ patients is needed in my pharmacy curriculum.	1	5	19	28	34	0	2	10	21	28	2	4	15	45	16	3	11	44	94	78

^a Confidence with each statement indicated using a five-point Likert scale, with 5=strongly agree and 1=strongly disagree.
SD=Strongly Disagree; D=Disagree; N=Neutral; A=Agree; SA=Strongly Agree
P1=first professional year; P2=second professional year; P3=third professional year; LGBTQIA+=Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, and Others

Table 3. Top Terms by Cluster Analysis

Cluster 1 Term	Cluster 1 Score	Cluster 2 Term	Cluster 2 Score
Question 13 – What was the MOST helpful/useful part of this activity?			
video*	0.81	patient*	5.43
resourc*	0.36	help*	5.07
knowledge	0.36	ask*	3.13
class*	0.17	activity	2.87
introduc*	0.15	pronoun*	2.62
explan*	0.06	people	2.43
great	0.06	practice*	2.26
term*	0.04	lgbtqia patient*	2.21
lectur*	0.04	care*	2.17
speak*	0.02	learn*	2.09
Question 14 – What was the LEAST helpful/useful part of this activity?			
quiz	0.26	active*	3.59
long	0.26	pronoun*	3.25
talk*	0.26	practic*	2.65
reinforce	0.26	patient*	2.22
end	0.03	lectur*	1.92
definitions	-0.12	ask*	1.92
inform*	-0.41	confus*	1.67
enough	-0.56	learn*	1.60
module	-0.60	understand*	1.58
person	-0.60	child*	1.44

*Indicates that the stem of the word/phrase is shown, rather than an entire word and that it encompasses all alternative forms.