

References

1. Quintner J, Galbraith M. The great trade-off in Workers' Compensation: Perceptions of injustice by those experiencing persistent pain. *Pain Med* 2022;23(3);456–465.
2. Sullivan MJL, Yakubov E, Scott W, Tait R. Perceived injustice and adverse recovery outcomes. *Psychol Inj and Law*, 2014;7:524–2. doi: 10.1097/AJP.0000000000000602.
3. Tait RC, Chibnall JT. Management of occupational low back pain: A case study of the Missouri Workers' Compensation system. *Psychol Inj and Law* 2016;9:298–312. doi: 10.1007/s12207-016-9272-4.
4. Wickizer TM, Franklin GM, Fulton-Kehoe D. Innovations in occupational health care delivery can prevent entry into permanent disability: 8-year follow-up of the Washington State Centers for Occupational Health and Education. *Med Care* 2018;56:1018–23. doi: 10.1097/MLR.0000000000000991.
5. Buffie N, Baker D. Rising disability payments: Are cuts to Workers' Compensation part of the story? Center for Economic and Policy Research. <https://www.cepr.net/report/rising-disability-payments-are-cuts-to-workers-compensation-part-of-the-story/>. Accessed 1/19/2022.

COMMENTARY

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Commentary

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Teaching Implicit Bias and Its Management in the Pain Care of Sickle Cell Anemia Patients in a Hyflex Pre-Professional Classroom During COVID-19

Jill E. Lavigne , PhD, MPH,* Aleah Groman, PharmD,* and Michelle Price, MLS, MA[†]

*Department of Pharmacy Administration, Wegmans School of Pharmacy, St John Fisher College, Rochester, New York, USA; [†]Lavery Library, Wegmans School of Pharmacy, St John Fisher College, Rochester, New York, USA

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Introduction

Clinical pharmacists partner with prescribers to manage pain, including sickle cell pain crises [1–3]. For example, the Department of Veterans Affairs has added clinical pharmacists to its primary care teams to support pain management and patient safety [1, 2]. For patients with sickle cell anemia, the addition of clinical pharmacists to an outpatient care team was shown to improve dose escalation of hydroxyurea, which can both improve outcomes and reduce the need for opioids [3].

During the coronavirus disease 2019 (COVID-19) global pandemic, New York State mandated mask-wearing, 6-foot distancing, and reduced classroom occupancy beginning in March 2020. Our Doctor of Pharmacy (PharmD) degree program chose a hybrid flexible (“hyflex”) model and randomized half of each pre-professional class to attend in the classroom or

simultaneously over Zoom in alternating weeks. As planned prior to the pandemic, students applied knowledge gained in the first semester (Table 1) to a second semester capstone workshop featuring the National Institutes of Health (NIH) Pain Consortium online sickle cell anemia patient case, Devon. Activities were integrated into the Fall 2020 and Spring 2021 semesters culminating in the patient with sickle cell anemia case as presented in a 3-hour workshop in February 2021. A combination of live lectures, online patient and health system cases, and online-self-assessments were used during live class sessions. Outcomes were assessed through written assignments, take-home quizzes, and exams. To assess the effects of hyflex on student learning outcomes, student exam, and assignment performance were compared for students randomized to attend in-person or over Zoom during academic year 2020–2021.

Table 1. Curricular Elements of Sickle Cell Disease Pain Management and Implicit Bias Universal Precautions, PharmD Third Pre-Professional Year, 2020–2021

Weeks	Course	Hours	Topic and Classroom Activities
September 7	Population Based Healthcare	2	Implicit Bias and Sickle Cell Disease [2] <ul style="list-style-type: none"> • Case: NIH COPE Sharee Sickle Cell Anemia Pain Management Case [1] • Case: Boston Medical Center ED Sickle Cell Anemia Pain Crises, Implicit Bias and Systems Improvement [3] • National Academies. (2020) Addressing Sickle Cell Disease: A National Blueprint for Action
September 21	Advanced Pharmacology and Therapeutics III	2	Opioids and Morphine Dose Equivalents (not specific to sickle cell disease)
January 26 to February 9	Practice Management	9	Managing Implicit Bias: Self and Practice <ul style="list-style-type: none"> • Harvard Implicit Bias Assessment: Race • Capstone Case: Devon (Workshop) • Pain Crisis Pharmacotherapy Plan • Quality Improvement Plan: Preventing Provider Implicit Bias Affecting Devon's [4] Care Plan
April 24	Advanced Pharmacology and Therapeutics IV	2	Sickle Cell Anemia Therapeutics

Methods

Third year pharmacy (P3) students enrolled during the COVID-19 pandemic (academic year 2020–2021) were typically female ($n = 35$ [64.8%]), white ($n = 44$ [88.5%]) and aged 25 (mean 24.7 [SD 2.19]). Training began in September 2020 with an introduction to implicit bias [4] as integrated into the NIH Pain Consortium's sickle cell anemia case, Sharee [5], including definitions, statistics, and the National Standards for Culturally and Linguistically Appropriate Services in Health and Health Care (CLAS Standards) [6]. Students privately reflected on moments during their internships or work experiences when they may have witnessed implicit bias. The majority of instructional time (Table 1) focused on a universal precaution approach and tools to prevent providers and systems from operating with implicit bias. The Institute for Healthcare Improvement's online, video case of Boston Medical Center was presented and found that the implementation of quality improvement tools (checklist, opioid dosing calculator, care pathway) in the emergency department resulted not only in improved care but also in providers' sudden realization that they had demonstrated implicit bias toward their sickle cell anemia patients [7]. We reviewed the National Academies' 2020 Sickle Cell Anemia Strategic Plan and Action Highlights [8] and reflected on sickle cell anemia and its quality improvement as a potential career opportunity for clinicians.

In Spring 2021, learning with the same instructor, the same students completed 4 classroom hours of quality improvement tools and skills training culminating in a 2-hour in-class workshop to apply clinical skills and quality improvement tools to the NIH Pain Consortium's patient case, Devon, an adolescent with sickle cell anemia presenting in the emergency department. Students completed the free, on-line Implicit Association Test (IAT): Race

(<https://implicit.harvard.edu/implicit/Study?tid=-1>) (IAT Race) in-class and wrote reflections about their scores compared to test norms. The IAT Race takes less than ten minutes to complete, does not require registration and provides a score relative to others' who took the test. Students made treatment recommendations based on the on-line case presentation materials and then made a quality improvement plan to protect the patient's treatment from being affected by provider implicit bias.

This study was reviewed and deemed exempt by the Human Subjects Review Board of St John Fisher College.

Analyses

Performance on this capstone sickle cell patient case was evaluated using qualitative methods. Two independent coders blinded to student identities and assignment each read and coded the care plans and systems improvement plans of each student (Table 1). After completing the first 10 responses, coders met to compare and resolve differences with a third serving as the tie-breaker. Coding rules were entered in a codebook, and then all responses were independently coded, compared, and any discrepancies were resolved.

The χ^2 tests were used to assess differences in the proportions of students in each group with a correct response. Fisher's exact test was used when any data cells had five or fewer observations. *T* tests were used to assess means and standard deviations between the groups. To adjust for multiple comparisons, we used Bonferroni and divided the original α -value by the number of analyses.

Results

After adjusting for multiple comparisons, we found no significant differences between the hyflex cohorts who attended by Zoom or in the classroom on the day of the exercise (Table 2). A majority of students in both the

Table 2. Learning outcomes of hyflex classroom students randomized to Zoom or classroom attendance

Instructional Element	Assessment Item	Learning Outcomes	
		In-Class (A) mean (SD) N = 24	Via Zoom (B) mean (SD) N = 27
Harvard implicit bias self-assessment: race			
Recognition of own potential bias		15 (62.5%)	21 (77.8%)
Word count, mean (SD)		164.8 (70.5)	145.7 (78.9)
Devon case: Pharmacotherapy recommendations			
Long-acting opioid		19 (79.2%)	16 (59.2%)
Short-acting opioid		20 (83.3%)	19 (70.4%)
Hydroxyurea		8 (33.3%)	13 (48.1%)
Other analgesic		9 (37.5%)	13 (48.1%)
Stool softener		0 (0%)	4 (14.8%)
Comorbid condition treatment		6 (25.0%)	11 (40.7%)
Naloxone		3 (12.5%)	4 (14.8%)
Non-pharmacologic pain management		11 (45.85)	13 (48.1%)
Quality improvement plan to prevent provider implicit bias from affecting Devon's care			
IHI QI Essentials Toolkit Methods Applied, mean (SD)		3.0 (1.8)	2.4 (1.9)
Word count, mean (SD)		241.5 (141.4)	202.4 (181.4)

classroom and Zoom groups wrote specifically about their recognition of their implicit biases based on their IAT-Race scores (62.5% and 77.8%, respectively). Written on-line reflections completed during live class time were similar in length at about 165 words (classroom) and 146 words (Zoom). Pharmacotherapy recommendations were also similar across groups, with the majority in both cohorts recommending both a long acting-opioid and short-acting opioid. Although not significantly different, a larger proportion of students in the Zoom cohort recommended hydroxychloroquine (48.1% cf. 33.3%), a stool softener (14.5% cf. 0.0%), treatment for comorbidities (40.7% cf. 25.05%), and at least one other analgesic (e.g., an NSAID) (48.1% cf. 37.5%). In contrast, although not significantly different, students in the classroom wrote longer reflections on the IAT-Race and longer plans to use quality improvement tools like checklists and care pathways to prevent implicit bias from affecting their pharmacotherapy recommendations.

The most commonly applied tools in both groups were: Driver diagrams, Plan-Do-Study-Act (PDSA) cycles, Cause-and-Effect (fishbone) diagrams, run charts, and the Project Planner [9]. Driver diagrams were used to illustrate the relationship between goals and “drivers” or contributing factors to the outcome. Driver diagrams support identification of specific change processes to test or improve [9]. PDSA cycles were applied to create plans to take action, analyze data and make change for a new cycle [9]. Cause and Effect (i.e., fishbone) diagrams were used to organize brainstorming for quality improvement and specifically the factors that effect a desired outcome, including itemized lists of people, processes, and environments [9].

IAT: Race

Both hyflex cohorts wrote reflections of similar length about their IAT-Race and its implications for the quality of care they provide. Students in both cohorts

acknowledged their implicit biases, risks to patient care and outcomes and noted that quality improvement tools such as care pathways, dosing calculators and checklists might protect patients, for example:

(Classroom Student 1): This assessment did make me more curious about how my biases will affect my decisions in practice, especially in situations in which decisions need to be made in a fast-paced environment. In situations like this I believe toolkits such as the [Institute for Healthcare Improvement (IHI)] toolkits and checklists will be helpful to limit my subconscious bias.

(Zoom Student 1): After taking the test for race, I was surprised by my results. Like many, I do not feel that I hold any racial prejudices or act on stereotypes. But again, that is in my conscious mind, and I must remember what implicit bias is. The development of my implicit bias may not entirely be in my control. ... My results may have correlated with the majority of test takers, but I do not see that as a way of “not feeling alone.” I instead realize how widespread implicit bias is. Although unintentional, its consequences can have a major impact on the level of care we provide as pharmacists. It can be harmful to patients in need... My experience taking this test...will surely have an effect on how I intend to practice in the future... I will try to put in place some quality improvement tools...

Classroom students were significantly more likely to question the validity of the IAT-RACE and questioned it as a rationale for implementing quality improvement in practice:

(Classroom Student 2): I really don't see how implicit bias can be measured from pictures and words when I know for a fact that I miss-clicked multiple times because they changed the letters that were associated with some pictures and words...

(Classroom Student 3): According to the score I received, I have no preference for either...I feel like the test is rather biased though. The measurements are no more than a person's ability to associate images with words on a superficial level and their level of coordination. It misses the complexity, depth of feelings, and associations that a person may have regarding a multitude of factors associated with groups and identity. Simply put, without considering a multitude of factors, this test cannot accurately identify bias. Even worse, it may place bias where none exists thus causing a bias instead (as a means of trying to correct oneself).

(Classroom Student 4): The assessment was interesting to take as it was a style of survey/quiz I have never taken before. With that being said I believe that is the only meaningful thing I took away from this exercise. Upon completion of the survey the creators explicitly state that these results are for educational purposes only and should not be used to make important decisions. With that statement being acknowledged I think it would be inappropriate to allow it to affect my approach to current and future practice which is an extremely important decision. In my opinion this is an exercise in patterns and not necessarily implicit bias. The act of discussing implicit bias is more beneficial and would yield more change than the survey itself...I would like to research how this survey affects others in their practice and if it yields meaningful results...

Finally, a few students in the classroom both contested the validity of the IRAT-Race and attested that they did not have any implicit bias by race; for example:

(Classroom Student 5): I think the assessment was trying to trick me the whole time. I do not have bias toward Black or White individuals. I think this assessment was trying to sway me toward bias by trying to link "bad" words with White people or Black people and "good" words with Black or White individuals...

Discussion

Our findings are consistent with the literature. "Hyflex" designs first appeared in the academic health professions literature in 2006 [10], yet the literature is limited. According to a recent survey of pre-professional students at 29 institutions in the United States, a majority preferred live lectures (47%) or a hybrid of live and recorded lectures (30%). For case studies specifically, only 9% preferred online, while more than 40% preferred either the classroom or the classroom plus on-line recordings [11]. Yet, at least one study found that pharmacy students performed significantly better on examination when live lectures were replaced with online lectures and discussion boards [12]. This commentary adds to the literature by addressing randomized, quantitative data on student outcomes, and compared a randomized face-to-

face cohort with an online cohort who shared the same synchronous class experience.

During the COVID-19 pandemic, our PharmD pre-professional program continued on-campus with reduced classroom capacity which we accomplished through hyflex instruction and randomization of students to two cohorts that alternated attendance in the classroom or over Zoom on a weekly basis. Performance was similar across cohorts.

Limitations

Although we found no statistically significant differences between cohorts, two instructors were focused exclusively on facilitating over the Zoom cohort remarked that some break-out rooms were quiet, with students appearing to work independently. Simultaneously in the classroom, students were observed talking and making eye contact at their tables.

A number of students questioned the validity of the Harvard Implicit Bias Self-Assessment: Race (IAT-Race) validity. Some comments demonstrated insight about the limits of a brief assessment and several expressed a preference for discussion with peer and instructors about implicit bias. However, other comments indicated a lack of appreciation of the unintentional and insidious nature of implicit bias. Student reflections may have been particularly thoughtful because they occurred within a few months of the Black Lives Matter movement and local events including body camera footage of Daniel Prude's mental health arrest and death in police custody [13, 14].

In both cohorts, student performance on the treatment plan component of the case may have suffered from the long break between clinical instruction in opioids (more than four months previous). In addition, the students had not yet had training in sickle cell anemia.

In summary, we found no differences in learning outcomes across hyflex randomized cohorts that attended synchronized instruction in the classroom or over Zoom in alternating weeks. The finding that students questioned the validity of the Harvard-affiliate test may have implications for other schools attracted to the free, anonymous, brief assessment for training purposes. Greater introduction to the test and its documentation as well as the definition of implicit bias is warranted.

Lessons Learned

Third-year pharmacy students randomized to hyflex synchronous classroom or Zoom attendance during the 2020–2021 academic year performed similarly on the capstone in-class pain management and clinical quality improvement case assignments.

References

1. Poirier RH, Brown CS, Baggenstos YT, et al. Impact of a pharmacist-directed pain management service on inpatient opioid use, pain control, and patient safety. *Am J Health-Syst Pharm* 2019;76(1):17–25.
2. Giannitrapani KF, Glassman PA, Vang D, et al. Expanding the role of clinical pharmacists on interdisciplinary primary care teams for chronic pain and opioid management. *BMC Fam Pract* 2018;19(1):107.
3. Han J, Bhat S, Gowhari M, Gordeuk VR, Saraf SL. Impact of a clinical pharmacy service on the management of patients in a sickle cell disease outpatient center. *Pharmacotherapy* 2016;36(11):1166–72.
4. Harasimowicz M, Schuman C, Lavigne J. Learn more about: managing implicit bias. NIH Pain Consortium-COPES Module Material website. Available at: <https://coepes.nih.gov/module/sharee-adolescent-sickle-cell-disease/learn-more-about-managing-implicit-bias> (accessed March 12, 2021).
5. NIH Pain Consortium Centers of Excellence. Sharee: Adolescent Sickle Cell Disease. Module 1, Event 1, In Her Own Words. NIH Pain Consortium-COPES Module Material website. Available at: <https://coepes.nih.gov/module/sharee-adolescent-sickle-cell-disease/event-1-meet-case-principals> (accessed March 12, 2021).
6. Office of Minority Health. US Department of Health and Human Services. A Physician's Practical Guide to Culturally Competent Care. Think Cultural Health website. Available at: <https://thinkculturalhealth.hhs.gov/education/physicians> (accessed March 12, 2021).
7. Project Implicit. Race Implicit Association Test (IAT). Available at: <https://implicit.harvard.edu/implicit/selectatest.html> (accessed March 12, 2021).
8. National Academies. Addressing sickle cell disease: A strategic plan and blueprint for action. Available at: <https://www.nationalacademies.org/our-work/addressing-sickle-cell-disease-a-strategic-plan-and-blueprint-for-action> (accessed March 12, 2021).
9. Institute for Healthcare Improvement. Quality Improvement Essentials Toolkit. Institute for Healthcare Improvement website. Available at: <http://www.ihl.org/resources/Pages/Tools/Quality-Improvement-Essentials-Toolkit.aspx> (Accessed March 12, 2021).
10. Beatty BJ. Hybrid-Flexible Course Design. EdTech Books; 2019. Available at: <https://edtechbooks.org/hyflex> (accessed March 3, 2021).
11. Hamilton LA, Suda KJ, Heidel RE, McDonough SLK, Hunt ME, Franks AS. The role of online learning in pharmacy education: A nationwide survey of student pharmacists. *Curr Pharm Teach Learn* 2020;12(6):614–25.
12. Wanat MA, Tucker AM, Coyle EA. A critical care hybrid online elective course for third-year pharmacy students. *Am J Pharm Educ* 2016;80(9):154.
13. Gold M, Clossen T. What we know about Daniel Prude's case and death. *The New York Times*, April 17, 2020. Available at: <https://www.nytimes.com/article/what-happened-daniel-prude.html>.
14. New York Attorney General's Office. Investigation in to the death of Daniel Prude. Available at: <https://ag.ny.gov/sipu/footage/daniel-prude> (accessed November 5, 2021).