



Journal of **BEST**
PRACTICES
in **Health Professions Diversity:**
Research, Education, and Policy

The Journal Dedicated to the Education and Professional Development
of Diverse Students for Careers in the Health Professions

Journal of **BEST**
PRACTICES
in **Health Professions Diversity:**
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FALL 2021

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**JOURNAL OF BEST PRACTICES IN HEALTH PROFESSIONS DIVERSITY:
RESEARCH, EDUCATION, AND POLICY**

Volume 14 • Number 2 • Fall 2021

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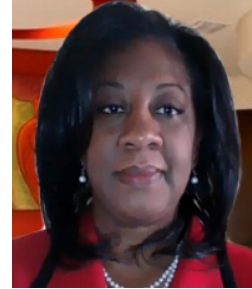
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GUEST EDITOR'S FOREWORD

Are your University's DEI Initiatives True Commitment to Change or Merely Optics?



The subject of diversity, equity, and inclusion (DEI) has been a priority at many institutions of higher education. Health science programs at historically Black colleges and universities (HBCUs) are no exception. Diversity has many dimensions, including race and ethnicity, gender and sexual orientation, socioeconomic and military status. Strategies to promote inclusivity in the classroom and a health-equity mindset that leads to sustained change in the healthcare industry should be integrated into the curriculum. Faculty are encouraged to address topics like implicit bias, cultural awareness, and embracing differences and to expose students to the widespread injustice of healthcare disparities.

These actions are good and necessary but, quite frankly, not enough to create meaningful, sustained change. We cannot teach students how to think and behave; DEI knowledge, skills, and attitudes germinate in real-life, direct exposure to people and activities. The lessons taught in the classroom are the sun and water that nurture the seed.

Far too often, we read and hear institutional leadership boasting about how committed they are to DEI and pointing to the diverse student and faculty population as proof. Unfortunately, in many instances, a deeper dive reveals no real intentional efforts or programming to encourage a campus-wide environment of inclusiveness for students, faculty, and staff. Diversity without intentional efforts toward inclusivity is more about optics than commitment to change. The educational experience is more than acquiring new knowledge and applying it to practice; education is also about building personal relationships, becoming self-aware, and understanding personal biases. Students in health professions programs must understand how their own personal biases can affect the care they provide. Demonstrating compassion is an essential soft skill in the healthcare workforce *and* in campus training.

Operationalizing inclusive measures on campus does not have to take a lot of time and effort but should be thoughtful and intentional. Creating programs, centers, or student-support groups led by faculty and designed much like any other student organization with a mission and goals demonstrates that the university not only accepts underrepresented populations, such as the LGBTQ, African American, and Latinx communities, but also includes them. Highlighting these intentional efforts on the university's website is a great way to showcase the inclusive campus culture for prospective students and faculty.

Embracing DEI in higher education can have an enormous impact on student success and faculty satisfaction and ultimately lead to the elimination of healthcare inequities. We must continue to make intentional efforts to recruit students, faculty, and staff from groups underrepresented in higher education and to ensure all voices are heard through cultivation of an inclusive environment. We must make students feel welcome, provide opportunities for them to actively engage in sponsored activities, and offer academic and mental-health support services. Coupling these deliberate steps with a curriculum that integrates DEI principles is essential to creating a more meaningful and sustained change. Schools that nurture these intentional measures may be better positioned to advance DEI in broadly significant ways.

Leslee Battle, EdD

A handwritten signature in black ink that reads "Leslee Battle". The script is fluid and cursive, with the first letters of "Leslee" and "Battle" being capitalized and prominent.

Guest Editor

NAMME PRESIDENT'S FOREWORD

Mental Health as a Vital Sign for 21st-Century Healthcare Providers



I recently attended the white-coat ceremony for new clinical psychology graduate students at a local institution of higher learning. As I reflected on their accomplishments, I wondered if mental health programs across the country honored their students this way. In these unprecedented times, people are diagnosed with mental health challenges at an alarming rate. Frontline care providers are few and far between (Hill et al., 2022; Wu et al., 2021), and how many are encouraged to assess their own mental status before attending to others? Their mental health is crucial to the long-term effectiveness of international healthcare (Acker, 1999). We must be proactive in adequately training the next wave of mental health providers and emphasizing their important role in the viability of our communities.

As a community, we must continue to address frontline workers' mental and physical health. Anxiety, post-traumatic stress disorder (PTSD), depression, and suicidality are common among them. What are potential interventions? We should consider honest, on-going conversations about personal and occupational limitations that can have a direct and indirect impact on job performance as well as best practices for self-assessment and strategy development. Training and post-hire annual reviews should include mental health examinations. Last, PTSD and grief support groups should be a fixture of health professional school curricula to help students, clinicians, scientists, educators, and administrators cope with the full spectrum of problems they encounter. Such curricula might be integrated in regular medical and scientific conferences and continuing medical education seminars. Auxiliary groups for family members often meet at the same time, engaging in poster presentations and plenary speaking sessions that emphasize the value of work-life balance and sustaining social support.

The pandemic has shown us that even the most resilient and well-trained scientists and clinicians can succumb to feelings of inadequacy, emotional and physical fatigue, and suicidality (Colligan, Smith, & Hurrell Jr, 1977; O'Connor, Neff, & Pitman, 2018; West et al., 2018). As a community, we should be intentional and proactive in modeling what we expect of the average citizen. Like pulse, respiratory rate, and temperature, mental health should be treated as a vital sign. I hope that we continue preparing the next generation of mental health specialists and clinicians to meet the unforeseen societal and medical challenges of the future.

Rosalind Gregory-Bass, MD, MS

A handwritten signature in black ink, appearing to read "Rosalind Gregory-Bass". The signature is fluid and cursive, with a long horizontal line extending to the left.

President, National Association of Medical Minority Educators (NAMME)

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The BioCORE Scholars Program, a Cohort Model, Improves the Academic Attainment of Biology Undergraduates of Color

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ABSTRACT

Using an algorithm incorporating high school GPA and SAT scores, we can predict a student's grade point average in biology at the end of our introductory undergraduate sequence. A disproportionate number of underrepresented minority students were predicted to have lower grades. This finding sparked our new, comprehensive approach to retain them. While scholarship programs promoting diversity often select the candidates with the highest SAT scores, our aspirational BioCORE Scholars program selects the students predicted to fail. Its interventions include study cohorts, peer mentors, community role models, and research participation. By the end of their first year, our scholars outperformed students with similar predicted grades, irrespective of ethnicity ($p = 0.001$) and were more likely to complete the gateway biology sequence ($p < 0.001$).

Authors' Note: We thank Dr. Timothy Nelson for use of the BPL algorithm he developed at SPU and Chad Steele for providing SPU institutional data. We are grateful to Dr. Angie Little (UC Berkeley) for sharing Compass Project application questions and Dr. Stamatis Vokos (California Polytechnic University) for early discussion of BioCORE Scholars program components. We also thank SPU biology and chemistry research faculty for their mentorship during BioCORE Scholars research week. This work was supported by SPU Academic Innovation Grants, Independent Colleges of Washington Leaders for Tomorrow funding, and generous SPU donors.

Significant improvements persisted beyond freshman year. Our data suggest early career interventions are crucial to student success.

Keywords: ■ Equity ■ Gateway Courses ■ Undergraduate Biology ■ STEM Education ■ Persistence

INTRODUCTION

Researchers have amply documented that for future economic success, the United States must increase both the number and diversity of graduates in science, technology, engineering, and math (STEM) (Chen & Soldner, 2013; Hong & Page, 2004; President's Council of Advisors on Science and Technology, 2012; Valentine & Collins, 2015). While recent years have witnessed some progress, Black, Latinx, American Indian, and Alaska native people remain poorly represented (Chang et al., 2014; Chen & Soldner, 2013; National Center for Science and Engineering Statistics [NCSES], 2019). Data show that the attrition rate for underrepresented minority students who intend to become STEM majors is higher than that for White students (Hurtado et al., 2010; Joice & Tetlow 2020).

These students leave STEM or medical programs for many reasons. Stereotype threat, or the perception that behavior will validate a prejudice about a social group, leads to underperformance in science and math (Steele, 1997; Steele & Aronson 1995). While many propose that socioeconomic factors affect SAT scores and academic preparedness (Dixon-Roman et al., 2013), others argue that the design of the standardized tests that lead to college admission (SATs and ACTs) reflect racial bias (Freedle, 2003; Santelices & Wilson, 2010). Once at college, uncertainty about belonging on campus can lead to social isolation and undermine the academic achievement of students of color (Walton & Cohen, 2007).

Various programs work to increase minority representation in STEM majors. Some, such as the Meyerhoff program, invite only those entering college with high SAT and ACT scores (Domingo et al., 2019). Other programs encompass a broader spectrum of college readiness (Matsui et al., 2003).

Our study at Seattle Pacific University (SPU) targets well-motivated students of color, whose high school grade point averages (GPAs) and SAT scores predict that they will struggle in biology courses. These vulnerable students are likely to leave STEM programs before fully realizing their potential. Rather than picking a single support strategy, we wanted to see whether a battery of interventions, offered in a community-based, aspirational setting, would promote their persistence and academic achievement.

For new student advising, we developed an algorithm that predicts biology GPA at the end of the gateway course sequence based on SAT or ACT scores and high school GPA. Students

predicted to need help are advised to enroll in an entry-level chemistry course before starting the general biology sequence to increase their chance of academic success. First-year students are coded as biology placement level 2 (BPL2) if their predicted biology GPA is below 2.4 and BPL3 if it is higher. In 2014, we noted racial disparities between the BPL2 and BPL3 groups. This finding provided the impetus to develop the BioCORE Scholars program to support motivated students who were predicted to struggle with and drop STEM courses.

Our program combines many approaches. It emphasizes cohort learning opportunities and builds a community of belonging. Students learn best by observation and modeling the behavior of near-peer role models (Bandura, 1977; Batz et al., 2015; Horsburgh & Ippolito, 2018; Pintér et al., 2021; Trujillo et al., 2015), so BioCORE Scholars enroll in the same sections of the required introductory biology course series, supported by a near-peer learning assistant and peer mentors. Identifying as a scientist improves persistence (Chang et al., 2014; Hurtado et al., 2010), so BioCORE Scholars are encouraged to join a career-related club or departmental society. Involvement in meaningful, hands-on lab research improves student success, so freshman research opportunities are built into the program (Fechheimer et al., 2011; President's Council of Advisors on Science and Technology, 2012; Russell et al., 2007). A modest stipend helps to alleviate financial anxiety (Hurtado et al., 2010) and provides an incentive to persist. Affirming personal values and positive life experiences in the written program application helps students to counter stereotype threat and imposter syndrome (Cohen et al., 2006; Steele & Aronson, 1995). As they become sophomores, juniors, and seniors, BioCORE Scholars can take on leadership positions as learning assistants or peer mentors, which reinforces their identity as scientists and increases their sense of belonging to the community (Trujillo et al., 2015).

The BioCORE Scholar interventions are fully described below. We also discuss results from the first five years of the program.

METHODS

Predicting biology grade point average

Biology grade point averages were predicted blind for all participants prior to their arrival at SPU. The algorithm factors in entering students' high school GPAs (HSGPAs) and scores on the SAT or ACT equivalent as well as 4 years of grades from the introductory biology sequence, BIO2101, BIO2102, and BIO2103. In 2015 and 2016, biology GPAs were predicted as $5.762 + 0.00296 * \text{SAT} + 1.302 * \text{HSGPA}$ ($R^2 = 51.4\%$). With changes to the SAT after 2017, predictions used only the math portion: $-6.181 + 1.524 * \text{HSGPA} + 0.00496 * \text{NEWMATSAT}$ ($R^2 = 49.4\%$). For international students without SAT results, predictions were $-4.304 + 1.874 * \text{HSGPA}$ ($R^2 = 35.4\%$). Once these GPAs had been calculated for a first-year cohort, those below the threshold (typically 2.4) were coded as Biology Placement Level 2 (BPL2) and those above as

BPL3. Over the study period (2015-2019), approximately 53 percent of incoming freshmen were coded BPL2 and 47 percent BPL3. Over the same years, considering all university freshmen, not just those who intended to pursue a biology major, 16 percent more BPL3 students were retained than BPL2 students.

Study population

SPU is a private university in the US Pacific northwest with approximately 2,700 undergraduates attending annually. In 2019, 50 percent of undergraduates were from ethnic minority groups. SPU uses a quarter system, and all SPU students who intend to major in biology must enroll in a 1-credit freshman seminar course, BIO1859, offered in the autumn quarter. To graduate with a degree in biology, students must also take a three-quarter introductory biology sequence, BIO2101, BIO2102, and BIO2103. From October 2015-2020, students enrolled in BIO1859 were recruited to take part in this study. Only students embarking on the introductory biology course sequence at SPU were included in the analyses below (n = 504). Students transferring in credit for these courses were excluded. Overall, 94.3 percent of students in BIO1859 opted to take part in the study. Race and ethnicity data were gathered from institutional records and listed according to Integrated Postsecondary Education Data System (IPEDS) criteria. This research was approved by SPU's Institutional Review Board (number 151601004R).

From 2015-2020, 10-15 BioCORE Scholars were recruited annually in November (n = 55). The online application form asked students to describe the following: how they overcame a difficult experience; where they would like to be in 5 years; and their key values. They were also asked to describe their ethnicity and whether they considered themselves part of a group underrepresented on campus. The program was advertised by undergraduate peer mentors and current and former BioCORE Scholars during BIO1859 as well as emails targeting first-year students who met the program criteria. All eligible applicants were required to attend an in-person interview where program components were discussed.

To be eligible, students had to intend to major in biology or biochemistry and to enroll in the general biology sequence at SPU (BIO2101: winter quarter, first year; BIO2102: spring quarter, first year; and BIO2103: autumn quarter, sophomore year). Transfer students with prior credits in comparable general biology classes were not eligible. Since BPL3-coded students had been advised to enroll in BIO2101 during their first quarter, most program applications came from BPL2-coded students who enrolled in BIO2101 in their second quarter.

Admission preference was given to BPL2-coded students from ethnicities underrepresented in STEM (Black, Latinx, American Indian, Alaska native, and Pacific Islanders) who were the first in their families to attend college. (We address questions about Asian representation later.) The BioCORE Scholar population analyzed below was 90.9 percent BPL2-coded students. Acceptance rates were high and increased from 82 percent in 2015 when funding was available for only 10

scholars, to 88-90 percent in 2018, 2019, and 2020 when 15 scholars were supported. The main reasons for not accepting applicants were nontarget ethnicity, BPL3 status, or if the candidate was part of an established community at SPU, such as being part of another university scholars program. Students completing all program interventions described below for at least one quarter are coded as BioCORE Scholars and their data are included in this report.

BioCORE Scholar Program interventions

Students who participated in the BioCORE Scholar Program experienced the following interventions:

- a. Membership in a cohort community. BioCORE Scholars enrolled in the same general biology lecture sections for BIO2101, BIO2102, and BIO2103 in the winter and spring quarters of freshman year and the autumn quarter of sophomore year. These gateway courses are prerequisites for any biology major at SPU.
- b. Support by peer learning assistants. Learning assistants, upper division students of color majoring in biology, attended the same class lectures as their scholar cohort. The SPU Center for Learning (CFL) trained them in effective learning strategies and workshop activities, and as part of BIO2101, BIO2102, and BIO2103, they led weekly workshops to help BioCORE Scholars understand course content, learn how to study, and prepare for exams.
- c. Support from a peer mentor. Scholars were assigned a peer mentor—a biology major, person of color, and typically, but not always, a former BioCORE Scholar. The CFL or personnel in Multi-Ethnic Programs (MEP) trained them to draw out scholar strengths, model strategies for academic success, and make referrals to other campus services as needed. Mentors and mentees met at least twice a quarter.
- d. Meetings with professionals of color. Scholars attended quarterly meetings where scientists of color shared their experiences in professions ranging from healthcare and medicine to PhD research, education, and industry.
- e. Research participation. At the end of the first year, scholars engaged in a hands-on, week-long, residential summer research program. They worked on projects in groups of 2-3, mentored by research faculty in biology or chemistry. At the end of the week, they presented their findings at a symposium attended by their peers, families, and university faculty and administrators.
- f. Annual retreats. At the start of sophomore year, scholars attended an overnight retreat at the SPU field station on Blakely Island. The group was able to reconnect, reflect on their progress, and set goals for sophomore year.

- g. Community-building events. Scholars participated in a variety of events, including a new scholar welcome reception, annual potluck, and movie nights. Starting in the fourth year, all participants attended a graduate pinning ceremony at which graduating BioCORE Scholars were recognized by faculty, students, family, and administrators.
- h. Financial support. Students received a \$1,000 stipend paid in installments over three quarters as they completed each quarter's program components. At the application interview, they signed an agreement to attend and participate in at least 80 percent of the program events described above. Failure to attend resulted in being dropped from the program and loss of the scholarship. In the 5 years of the program, only 2 of the 55 scholars lost their scholarship due to nonattendance.
- i. Assessment. During the summer research week, BioCORE Scholars were asked to give anonymous written feedback on their experience in the program through a survey.

Using SPU resources, the total cost of program interventions per scholar was approximately \$2,500.

Statistical analysis

Effects of the BioCORE Scholars program were assessed throughout the participants' academic careers. In the first year, at the end of the winter quarter, we compared the GPAs they earned in BIO1859 and BIO2101 to the GPAs predicted. We repeated this analysis at the end of spring quarter following BIO2102. We also compared the success of ethnic minority scholars to that of nonscholars of all ethnicities, including those targeted. IPEDS criteria were used to define people of color. Students of unknown ethnicity were excluded when ethnicity was the variable under analysis. Average improvement over prediction was compared using two-sample t-tests. As in all subsequent parametric analyses, homogeneity of variance was confirmed using Levene's test, and normality was confirmed using one-sample Kolmogorov-Smirnov tests.

In the second year, we examined retention in the major and academic performance in the core biology course series. BioCORE Scholars took the third quarter of introductory biology (BIO2103) in the autumn quarter of their sophomore year. We divided students into five categories based on ethnicity and biology placement level: (1) BioCORE Scholars, most of whom are people of color and coded BPL2; (2) nonscholars who are people of color coded BPL2; (3) Whites coded BPL2; (4) people of color coded BPL3; and Whites coded BPL3. Retention in the biology major was tested using a χ^2 goodness-of-fit model. At the timepoint when we compiled our data, the 2020 BioCORE Scholar cohort had not complete the three-class sequence and so they were omitted from these analyses.

In addition to retention in the major, we evaluated retention at SPU, defined as continuing enrollment at the university one year after matriculation, regardless of continuation in biology, using Fisher's exact test. This analysis compared ethnic minority BioCORE Scholars to nonscholars of all ethnicities, including those targeted.

Finally, we examined improvement over predicted biology GPA throughout students' careers, controlling for the number of biology credits attempted. At the end of December 2020, data were collated from the 2015-2019 cohorts for students who had completed the introductory biology sequence. BioCORE Scholars' improvement over prediction was compared to that of both nonscholars of color and White nonscholars. We also compared BPL2 BioCORE Scholars to other BPL2 students and BPL3 students, irrespective of ethnicity. The five BioCORE Scholars who were coded BPL3 were excluded from this second analysis. For both analyses, marginal mean improvement over predicted GPA in biology was compared for all groups using a one-way ANCOVA, where number of biology credits attempted was the covariate. To meet assumptions of normality and homogeneity of variance, we used a $\ln(x+4)$ transformation since given the 0-4 GPA scale, the maximum deviation from the predicted GPA was ± 4.0 . For each analysis, we confirmed that the interaction between the covariate of biology credits attempted and the 3-level demographic parameter was not a significant and based our conclusions on a main-effects model. Post-hoc comparisons used Sidak's test. All analyses were conducted in IBM SPSS (v27).

In 2020, due to COVID-19 restrictions, research week was postponed until sophomore year, so the 2019 scholar cohort, whose data were included in the above analyses, had not experienced research week or the in-person retreat. All learning assistant workshops and speaker meetings and community building events were held remotely via Zoom from April 2020 to June 2021.

RESULTS

Demographics

Figure 1 shows the ethnic diversity of the total study group—all the BIO1859 students and BioCORE Scholars who agreed to take part in the study from 2015-2020 (see Figure. 1a): 56 percent were recorded as non-White, and these students were overrepresented in the BPL2-coded group (see Figure. 1b) and underrepresented in the BPL3-coded group (see Figure. 1c). Latinx students comprised more than twice, and Black students more than five times the percentage of students in the BPL2 group relative to the BPL3 group.

Among BioCORE Scholars, one-third were Black and one-third Latinx (see Figure. 2a). IPEDS definitions of race and ethnicity inaccurately identify underrepresented groups. Specifically, 18 percent of BioCORE Scholars were categorized as Asian by IPEDS; however, on the BioCORE Scholars' application form, one-third of these students described themselves as Filipino (7% of total scholars) and over one-quarter self-identified as Vietnamese or Southeast Asian (5% of total

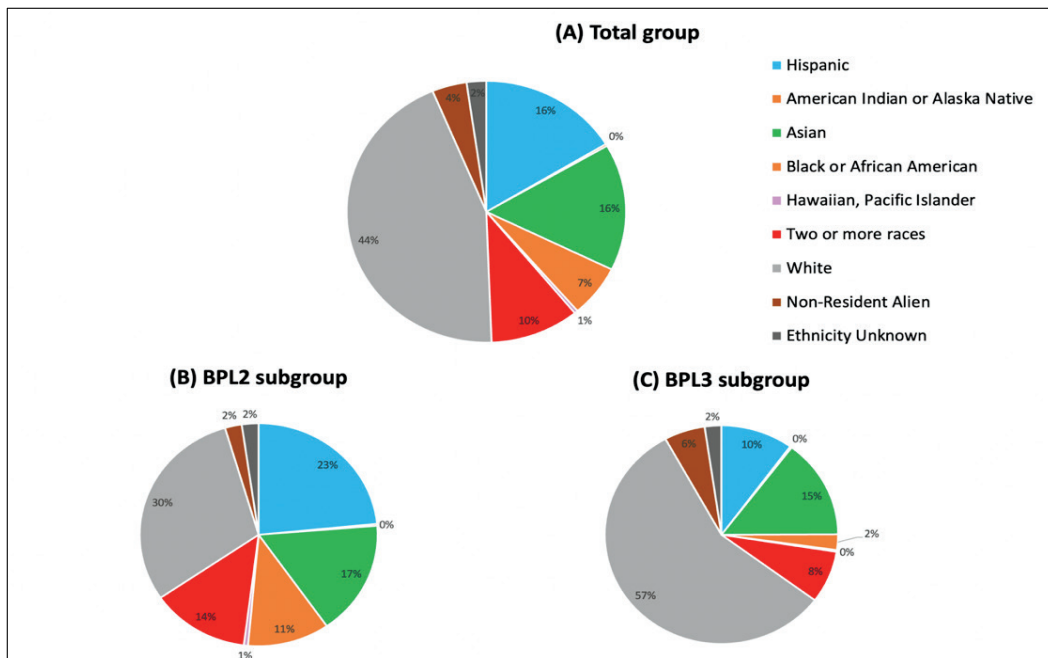


Figure 1. Study group demographics as defined by IPEDS. **(A)** The ethnicity of all students in BIO1859 from 2015-2020 who took at least the first general biology class (BIO2101) at SPU and consented to be part of the study ($n = 504$). **(B)** Students coded BPL2, which predicts lower biology GPAs ($n = 205$). **(C)** Students coded BPL3, which predicts higher biology GPAs ($n = 294$). Analyses omit students who did not consent to participate (5.7%) and those without BPL coding ($n = 5$).

scholars) (see Figure. 2b). IPEDS lacks categories for these groups, which are underrepresented in STEM.

While 65.8 percent of the undergraduate population at SPU was female in 2019, the percentage of women intending to be biology majors was 71 percent, as determined from enrollment in BIO1859 2015-2019. Our BioCORE Scholars program attracted few male applicants; the group was 90.9% female.

Statistical analysis: Early career progress of BPL2-coded scholars

On average, after taking BIO1859, BIO2101, and BIO2102, student biology GPAs exceeded the predicted values (the calculation included BIO2103). However, gains among BPL2 students were

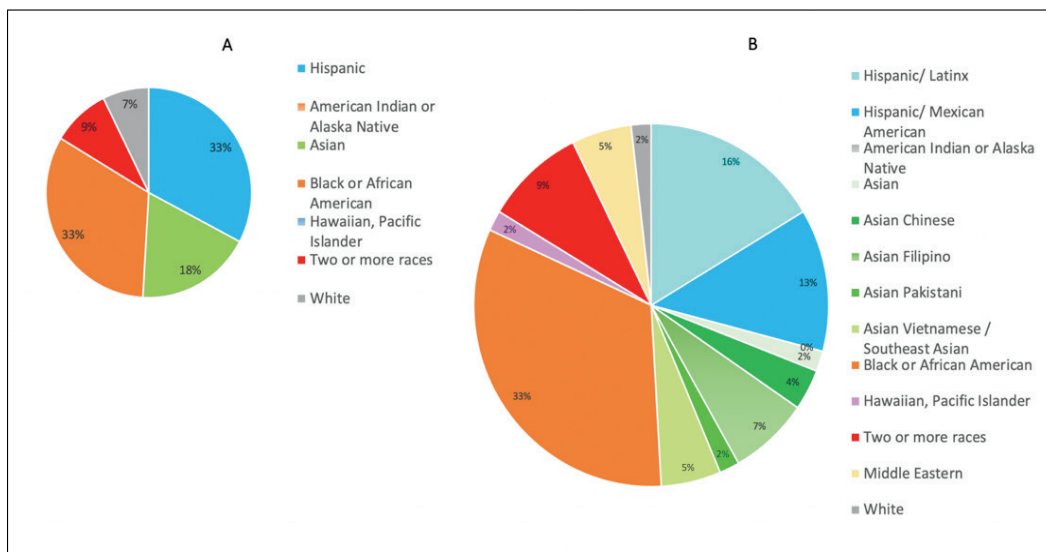


Figure 2. Ethnicity of the BioCORE Scholars group, 2015-2020 (n = 55). (A) IPEDS categories. (B) Ethnicity reported by students on their BioCORE Scholars applications. Note: IPEDS codes Middle Eastern students as White, and its Asian category subsumes groups both over- and underrepresented in STEM.

not equal. Specifically, BPL2 BioCORE Scholars showed significantly greater gains than BPL2 nonscholars (see Figure. 3). After completing BIO1859 and BIO2101, ethnic minority BioCORE Scholars outperformed ethnic minority nonscholars by 0.43 grade points (see Figure. 3a) and all BPL2 ethnicities by 0.44 grade points (see Figure 3b). After BIO2102, their success persisted; they outperformed ethnic minority nonscholars by 0.31 grade points (see Figure. 3c) and all ethnicities by 0.41 grade points (see Figure. 3d). BioCORE Scholars consistently demonstrated better performance in introductory biology courses than their peers.

Completing the general biology sequence is a prerequisite for graduating with any biology degree at SPU. While rates varied greatly among demographics, BPL2 minority BioCORE Scholars completed the sequence (71%) at rates comparable to BPL3 students (minorities, 71%, Whites, 73%; see Figure. 4). BPL2 minority nonscholars were at greatest risk of failing to complete the sequence (42%) followed by White BPL2 nonscholars (62%). These data suggest that the BioCORE intervention significantly increased the likelihood that students at risk of dropping out of the biology major would complete the gateway biology courses.

We detected no significant difference in overall university retention measured at 12 months after initial enrollment between BPL2 BioCORE Scholars (84%), BPL2 minority nonscholars

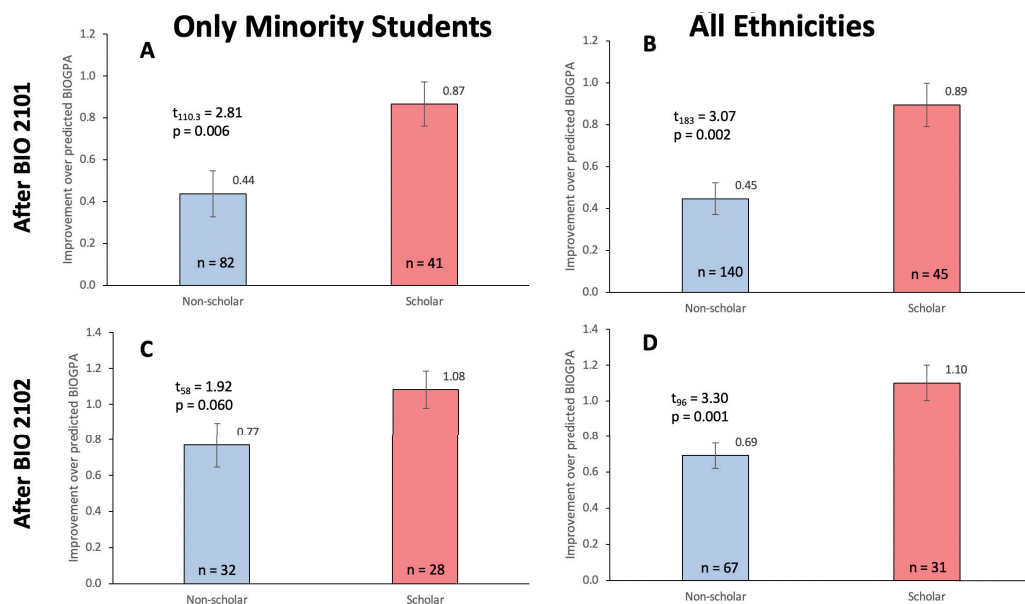


Figure 3. Average (\pm SE) improvements over biology GPA predicted at SPU entry among BPL2 BioCORE Scholars and BPL2 nonscholars. Earned and predicted GPA were compared after students' took BIO1859 and the first (BIO2101) and second (BIO2102) quarters of introductory biology. BioCORE Scholars' GPA was 0.31 higher than minority nonscholars' (A and C) and 0.44 greater higher than all nonscholars' (B and D).

(80%) ($p = 0.82$), and BPL2 students of all ethnicities (77%; $p = 0.52$; see Figure. 5). While these data were not statistically significant, point estimates of retention were 4 percent higher for BPL2 minority BioCORE Scholars than for BPL2 minority nonscholars and 7 percent higher than for BPL2 students of all ethnicities. As a point of reference, 2015-2019 university-wide retention rates, irrespective of major, were 73 percent for minority BPL2 students, 71 percent for White BPL2 students, 90 percent for minority BPL3 students, and 87 percent for White BPL3 students.

Statistical analysis: Scholar success from freshman to senior year

We investigated the effects of the BioCORE Scholars program on the biology GPAs of those who completed the introductory sequence throughout their careers in the biology department at SPU

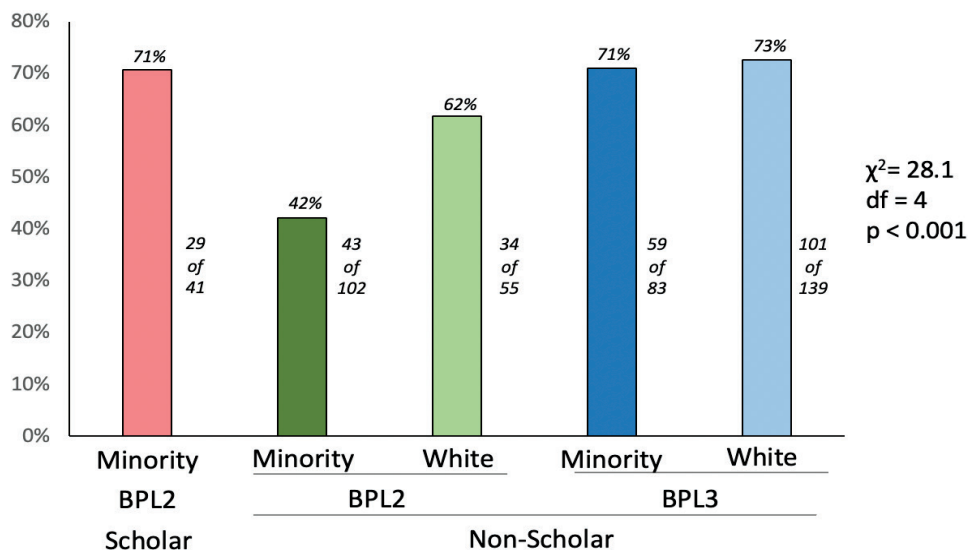


Figure 4. First-year retention in the biology major. Percentage of students completing all three courses in the general biology sequence (BIO2101, BIO2102, BIO2103) based on BioCORE Scholar status (yes/no), biology placement level (BPL2=predicted at entry to perform below average; BPL3 = predicted at entry to perform above average), and ethnicity (minority = students of color).

by ethnicity (see Figure. 6) and BPL status (see Figure. 7). When controlling for the number of biology credits completed, BioCORE Scholars showed significantly greater GPA gains than nonscholars across all ethnicities (see Figure. 6). Scholars improved more than 1 grade point over the prediction, which was 2.0 and 2.5 times more than minority and White nonscholars, respectively ($F_{2,309} = 17.540$; $p < 0.001$; see Figure. 6a). Further, the covariate of the number of biology credits attempted had a significant effect on biology GPA ($F_{1,309} = 10.121$, $p = 0.002$), which tended to increase with credits. Although no interaction between number of biology credits taken and demographic group was significant, BioCORE Scholars tended to improve substantially over their predicted biology GPA early in their careers; some minority nonscholars achieved similar improvements but much later (see Figure. 6b). These data suggest that the biggest benefits of the BioCORE Scholars' program coincide with its first and second year interventions. We conclude that, while many of their nonscholar counterparts leave the biology major, BPL2 BioCORE Scholars' quick success supports retention (see Figure. 4).

Based on BPL rather than ethnicity, BPL2 BioCORE Scholars demonstrated biology GPA gains that were 1.6 and 4.1 times higher than BPL2 and BPL3 nonscholars, respectively ($F_{2,304} =$

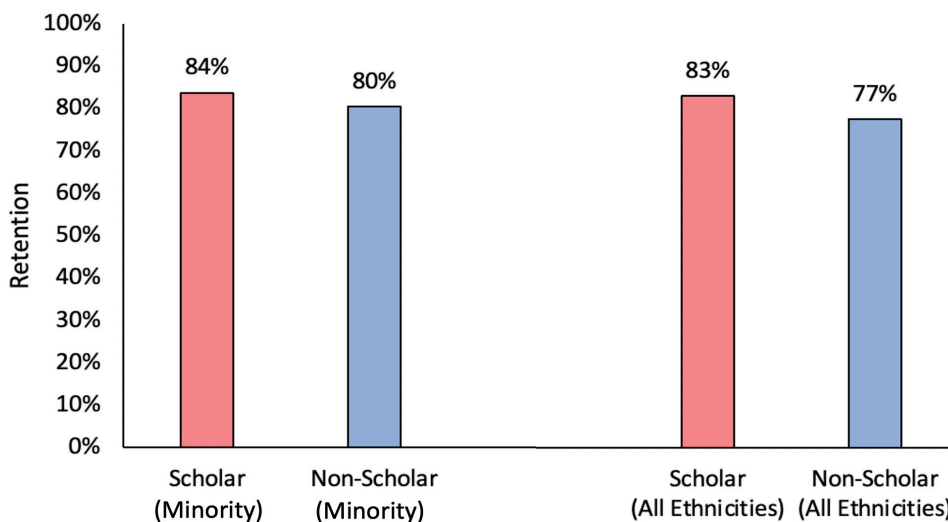


Figure 5. First-year retention of BPL2 students intending to pursue a biology major at SPU. The graph shows the percentage of the study group enrolled in any classes at SPU 12 months after enrolling in BIO1859. Ratios compare the number of students retained to the number not enrolled by ethnicity.

38.676; $p < 0.001$; see Figure. 7a). We found no significant interaction between biology credits and demographic group, but the number of biology credits attempted did significantly affect biology GPA ($F_{1,304} = 17.126$; $p < 0.001$). Again, BioCORE Scholars tended to show improvements early, whereas gains over predicted GPA for BPL2 nonscholars tended to occur later (see Figure. 7b). These data suggest that program interventions drive its benefits.

DISCUSSION

The BioCORE Scholars program was designed to compensate for inequities that resulted in minority first-year students' overrepresentation among those predicted to have low biology GPAs. Our biology placement level (BPL) algorithm was designed to predict biology GPA at the end of the three-quarter introductory biology sequence, but it can also be used as an objective benchmark to monitor students' progress from the first to senior year. The BioCORE program selects minority students coded BPL2 at matriculation. All BPL2 students are at risk of dropping the biology major and are typically ineligible for scholarships based on their SAT scores and high school GPAs. No other interventions at our institution addressed their needs.

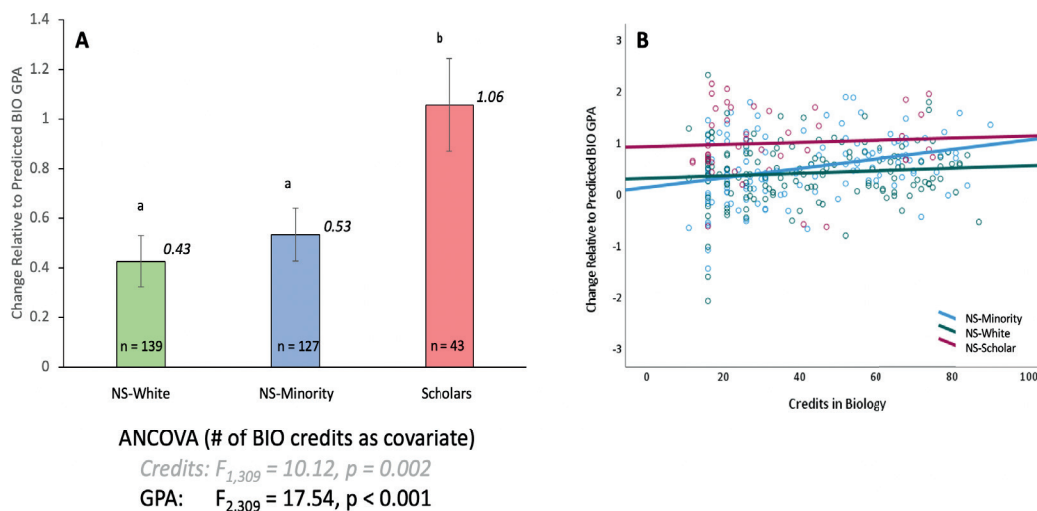


Figure 6. Average (\pm SE) improvement in biology GPA over the college career by ethnicity. **(A)** Scores for minority BioCORE Scholars, minority nonscholars, and White nonscholars from 2015-2019. Letters above the bars represent significant between-groups differences based on Sidak-corrected post-hoc analyses. BioCORE Scholars demonstrated significantly greater gains compared to the two groups of nonscholars ($p < 0.001$). Nonscholar groups did not differ significantly ($p = 0.380$). Marginal means control for the number of completed biology credits, included as a covariate in the ANCOVA model. **(B)** Change relative to predicted biology GPA

The data show that BioCORE interventions significantly improved scholars' biology GPAs over predicted values in gateway biology classes, and these improvements exceeded those for all other BPL2 students (see Figure. 3). BPL2 BioCORE Scholars completed biology major pre-requisite classes at significantly higher rates than other BPL2 minority students (see Figure. 4). First and second year university-wide retention rates among BioCORE Scholars were 4-7 percent higher than those for nonscholars, although this result was not significant. The early interventions translated into a significant increase in BioCORE Scholars' biology GPAs that was maintained to graduation (see Figures. 6 and 7). In contrast, BPL2 minority students who did not receive these interventions were more likely to leave the general biology sequence early, never realizing their potential, and those who persisted improved much later in their college careers. The 16 percent discrepancy in retention between BPL2 and BPL3 students institution-wide suggests programs similar to BioCORE should be implemented in other disciplines. Because the program is only in its sixth year and was interrupted by the pandemic, we do not have sufficient data to compare scholar and nonscholar graduation rates and persistence in STEM. These analyses are planned for the future.

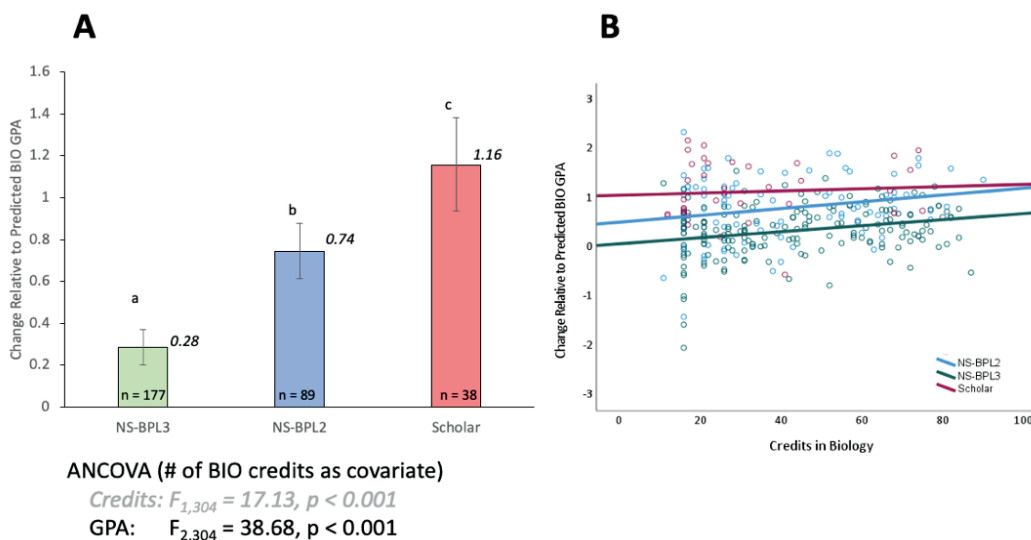


Figure 7. Average (\pm SE) improvement in biology GPA over the college career by BPL status. (A) Scores for BioCORE Scholars and students predicted at entry to perform below average (BPL2), or above average (BPL3) in biology. Letters above the bars represent significant between-groups differences based on Sidak-corrected post-hoc analyses. BioCORE Scholars demonstrated significantly greater gains than the two groups of nonscholars ($p \leq 0.004$), who differed from each other ($p < 0.001$). Marginal means control for the number of biology credits completed, included as a covariate in the ANCOVA model. (B) Change relative to predicted biology GPA by number of credits taken.

Ethnic minority STEM students are more likely than White students to leave college in their first year (, Joice & Tetlow, 2020; Seymour & Hewitt, 1997). Early success in gateway classes is a significant factor in retention of minority and first-generation college students, who are underrepresented in STEM (Barr et al., 2008; Crisp et al., 2009; Dika & D'Amico, 2016). Even modest increases in STEM gateway class grades can encourage “hyperpersistence”, resilience, and grit (Harris et al., 2020). Our data support these findings; once past the first-year sequence of biology classes, BioCORE Scholars’ improvement persisted. Raising the GPA early increases the likelihood of successful applications to summer internship programs, scholarships, and employment in science. Success breeds success (van de Rijt et al., 2014), and early interventions are crucial to an underrepresented student’s degree trajectory.

Programs to increase diverse representation in STEM fall into two camps: those selecting only talented, highly prepared and motivated minority students and those selecting well-motivated, talented, but less well-prepared students (Estrada et al., 2017). Our study selected students in the

latter category and provides further evidence that STEM potential cannot be predicted solely by standardized test scores (Matsui et al., 2003; 2018). The validity of using SAT or ACT scores to assess the potential of university students has been increasingly called into question (Guinier, 2015). Indeed, many universities have abandoned their use in undergraduate admission decisions (University of California, 2021, University of Washington, 2020, Washington State Council of Presidents, 2021).

However, removing the SAT/ACT barrier to college entrance is insufficient to increase student diversity in the biology major. Our data demonstrate that without our program interventions, BPL2 students of color were 29 percent less likely to complete the gateway sequence. They indicate that universities must devise, implement, and support programs like BioCORE Scholars that target people underrepresented in STEM and meet their specific needs. Without institutional support of these programs and program staff, the talents and insights of underrepresented students will be lost to society.

The BioCORE Scholars group analyzed in this report was 90.9 percent female. NCSSES (2019) has shown that 63 percent of biological science degrees were conferred on female rather than male students, irrespective of ethnicity, although women account for approximately 71 percent of the degrees awarded to Blacks (NCSSES 2019). While women's representation among US medical school applicants and graduates has crept closer to parity with men's, Black men remain underrepresented (Association of American Medical Colleges [AAMC], 2019). In addition, more male than female STEM students drop out of college, rather than switching majors, especially men who are first-generation college students from lower income backgrounds (Chen & Soldner, 2013; Joyce & Tetlow, 2020). Therefore, one of our aims is to encourage men, especially Black men, to apply to pipeline programs like BioCORE Scholars. We are currently investigating why more women than men apply to BioCORE Scholars.

Although the majority of BioCORE Scholars are of ethnicities underrepresented in STEM—Black, Latinx, American Indian, Alaska native (National Science Foundation [NSF], 2017), the 18 percent classified by IPEDS data as *Asian* needs further discussion. Asian students are typically considered well-represented in STEM. However, the term covers a broad array of distinct ethnicities, many of which are underserved and underrepresented. When data on Asian-American applicants to US medical schools are disaggregated, Southeast Asian applicants comprise only 5 percent, a smaller percentage than Black or Latinx applicants (AAMC, 2016). Similar arguments have been made to disaggregate data identifying Southeast Asians; for example, Filipino, Thai, and Vietnamese people are underrepresented in STEM (Didion et al., 2012). Admissions criteria for STEM scholar programs must take intersectionality into account. Exclusion based on one criterion, the very broad racial category *Asian*, misses the challenging reality students face if they are part of a small, isolated subpopulation. That difficulty is compounded if they are first-generation college students from newly migrated families. Indeed, when questioned about their sense of belonging on campus, Rainey et al. (2018) found the responses of Asian STEM majors matched those of their Black and Latinx peers rather than those of White students.

The BioCORE Scholars program uses a package of interventions, so comparing or parsing their individual effectiveness is difficult. Future research will address this limitation.

We had no direct, objective measure of the sense of *belonging* to the STEM community, but other authors have demonstrated that it is significant to students' success (Rainey et al., 2018; Strayhorn, 2012; Thoman et al., 2014; Walton & Cohen, 2011). The following quotes came from an anonymous poll of our scholars during the summer research week in 2017. They provide anecdotal evidence of the power the BioCORE Scholars program had in increasing students' sense of belonging on campus and as scientists.

- “The BioCORE cohort are not just classmates—they are family.”
- “Had it not been for the BioCORE Scholars program, I would've never reached out to peer groups in order to develop better studying habits ... I would've been too afraid.”
- “Freshman year, BioCORE provided a safe space when I was feeling homesick. Sophomore year, BioCORE provided support and motivation to get through O Chem!”
- “BioCORE Scholars provided a space for me to feel confident in myself and my ability to achieve the goals that I want to achieve.”

CONCLUSION

Diversifying the STEM community is imperative as we work toward greater equity in our field (Valantine & Collins, 2015). The types of questions STEM research asks depend on who is conducting the research. The more perspectives, the more likely we are to solve biological problems that are relevant to the whole population. Our data support early career interventions for underrepresented students that provide community, support academic engagement, and promote self-belief. Our analyses show significant improvements in biology GPA for students of color predicted to have unsatisfactory biology grades based on their SAT and high school performance. BioCORE Scholars were more likely to complete gateway biology courses and their early GPA improvements persisted throughout their degree path. Our findings are consistent with those of other STEM programs for underrepresented minorities that are less restrictive in their academic admission requirements (Matsui et al., 2003). Our interventions come at relatively low financial cost to the university and increase the probability that undergraduates from groups underrepresented in biology will realize their academic potential.

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Representing Diversity or Lack-Thereof: An Analysis of College/University Health Science Education Program Websites

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ABSTRACT

Addressing lagging diversity among health professionals while seeking to fill high-demand positions will require health science education (HSE) programs to recruit students from currently underrepresented groups. This study evaluated the websites of programs in the most needed professions (n = 114) against 12 diversity metrics and across type of institution, degree levels, and disciplines. On average, each program met 2 criteria (range 0-10), and most of their websites (79%) showed > 1 image of an individual from an underrepresented group. Public college and degree-offering programs met more diversity metrics than the other categories assessed. All HSE programs, especially the most accessible, should seize opportunities to improve their presentation of diversity to recruit students from underrepresented groups.

Keywords: ■ Diversity ■ Health Professions ■ Health Sciences ■ Student Recruitment ■ Website

INTRODUCTION

Due to its aging population, the United States faces a growing demand for healthcare. Employment in healthcare professions is projected to grow 15 percent from 2019 to 2029 (U.S. Bureau of Labor Statistics, 2021). Shortages at all levels in all disciplines are predicted.

At the same time, the population is increasingly diverse. The US Census Bureau (n.d.) predicts that the non-Hispanic White population will shrink from 199 million in 2020 to 179 million in 2060 and cease to comprise the majority after 2045. Significant growth of the multiracial and foreign-born populations is also projected over the next several decades (Vespa, Medina, & Armstrong, 2020).

Having a more diverse healthcare workforce has been shown to increase patient satisfaction, patient-clinician communication, and access to care (National Center for Health Workforce Analysis, 2017)). Overall, the healthcare workforce is becoming more diverse, but research shows higher representation of individuals from minority backgrounds among entry-level positions that require lower skills; they remain underrepresented in highly skilled jobs that require high levels of education (Snyder, Frogner, & Skillman, 2018).

The demographics of health science education (HSE) programs, defined as medical education programs for health professionals other than nurses and physicians, demonstrate why most racial and ethnic minorities are underrepresented in health science professions that require an educational credential. The Association of Schools Advancing Health Professions (2019) reported that among its member institutions, 69.7 percent of students identified as White, exceeding their 60 percent representation in the general population (US Census Bureau, n.d.). Only 10.1 percent of students in HSE programs identified as Hispanic or Latinx, although these groups represent 18.5 percent of the general population; and 6.5 percent of students identified as Black or African American, while comprising 13.4 percent of the general population (ASAHP, 2019; US Census Bureau, n.d.). The percentage of Asian students was closest to its representation: 5 percent of HSE students identified as Asian, and Asians comprise 5.9 percent of the general population. Note that 76.5 percent of students identified as women, 22.5 percent as men, and 1.0 percent as other.

Historical barriers to enrollment in HSE programs include academic preparation, tuition costs, and lack of knowledge about career opportunities in the healthcare professions (Valentine, Wynn, & Mclean, 2016). To dismantle these barriers and increase the diversity of students enrolling in HSE programs, recommendations include review of admission practices to ensure equity, creation of summer career exploration programs, strategic partnerships to increase recruitment of diverse applicants, and creation of mentorship programs at all stages of enrollment (Valentine et al., 2016). While we know that inclusion efforts—defined as strategies and practices that promote meaningful social and academic interactions among diverse persons and groups (Tienda, 2013)—ensure that individuals from underrepresented groups graduate and create a more diverse workforce (Wilbur et al., 2020), their recruitment and enrollment are necessary first steps.

With respect to recruitment, perceived diversity has been shown to positively influence the opinion of students underrepresented in medicine (Ku, Li, Prober, Valantine, & Girod, 2011), and students from minority backgrounds may be more likely to persevere to graduation when the program faculty are adequately diverse (Dickson & Zaferero, 2020; Thompson-Rogers et al., 2018). Potential students often get their first impression of an academic program when they visit its website. Studies reviewing diversity-related website content for some health education programs, particularly for medical residencies, generally found little and recommended an increase to attract students from diverse backgrounds (Driesen et al., 2020; Sanchez et al., 2021; Smith, L. V. et al., 2016; Smith, J. B. et al., 2021). However, health science program websites have received little attention. This study analyzes the diversity-related content of HSE program websites in the most high-demand professions.

METHODS

We identified 8 high-need health science professions based on Ohio hospitals' predictions that filling vacant positions would pose "a lot of difficulty" or be "almost impossible" (Center for Health Affairs, 2019): medical assistants, medical laboratory technicians, respiratory therapists, surgical technicians, pharmacy technicians, sterile processing technicians, general sonographers, and vascular sonographers. Because an entry-level position does not require a credential, sterile processing technology was excluded from this study. We then identified accredited Ohio programs in the remaining 7 disciplines. We categorized them by degrees awarded (diploma/certificate, associate degree, or bachelor's degree) and type of institution: public college, private college, for-profit institution, school, hospital, or other. Institutions classified as *schools* included career-technical education centers established by individual public school districts or jointly created by two or more districts.

Links to program websites were obtained through a Google search. Where two programs were offered in a particular discipline (e.g., a certificate and an associate degree), we focused on the page for the lower credential; based on its lower cost and shorter time to completion, we considered it the more accessible program and excluded the other from the study.

The remaining 114 program websites were each evaluated by two reviewers, who independently identified the presence or absence of 12 specific diversity metrics. A metric was considered present if it appeared on the program website or another website that could be accessed directly from the program website (within 1 click). If the two reviewers disagreed about a particular metric, another reviewer would discuss the problem with them until all three reached consensus. The metrics included a diversity statement for the program; a diversity statement for the institution; institutional diversity initiatives, such as newsletters, programming, and activities; institutional affinity groups based on gender, disability, or LGBTQ+ status; a specific diversity section/

page; a designated diversity leadership position; disability coordinator contact information; and photographs/videos of individuals underrepresented in the health sciences, in any role and in positions of authority (e.g., faculty, administrators, board members). Images of White women were not considered to represent a minority in the health science professions under study because, in contrast to other health professions, such as medicine, they comprise the majority (Health Workforce Analysis, 2017). Asian representation varies among the health sciences (Health Workforce Analysis, 2017) but is generally below that in the general population, so images of Asians were considered to represent a minority in health sciences as were images of Blacks/African Americans and Latinx.

We used Kruskal-Wallis tests to compare the number of website diversity criteria met across type of institution, degree level, and type of program. They were followed by nonparametric pairwise comparisons using Dunn tests, which adjust for multiple group comparisons. To ensure that the results of the statistical analysis were meaningful, we excluded categories with a number of available websites comprising less than 5 percent of the total number of websites reviewed; for example, pharmacy technician programs comprised only 4% of all of the websites in our sample and so were excluded from further analysis. All analyses were conducted using JMP Pro 15 (SAS Institute, Cary, NC).

RESULTS

Overall, 114 HSE program websites were reviewed, representing 7 HSE disciplines at 3 credential levels at 5 types of educational institution. The programs were categorized by type, type of institution housing it, and degree(s) awarded (Table 1). The profession most represented was medical assistant, accounting for 33 percent ($n = 38$) of the websites analyzed. Pharmacy technician programs accounted for only 4 percent ($n = 5$) of the sample and based on a priori statistical criteria (see above), were not included in the analysis. The majority of the institutions housing the programs were public colleges (65%; $n = 74$), followed by schools (19%; $n = 22$), and for-profit organizations (7%; $n = 8$). Private colleges, hospitals, and other institutions, each housing 5 percent or less of the total number of programs, were also excluded. More than half of the programs (56%; $n = 64$) award associate degrees, followed by diplomas/certificates (35%; $n = 40$), and bachelor's degrees (9%; $n = 10$).

Of the 12 diversity metrics included in the analysis, the median number met by a single program was 2 (Table 2). Most programs (79%; $n = 90$) posted a photograph of an individual from an underrepresented community in any role; it was the only criterion the majority met. The second-most commonly met criterion was a photograph of an individual from an underrepresented community in a position of authority (41%; $n = 47$). Beyond photographs, 40 percent ($n = 46$) met the

Table 1: Characteristics of Study Programs

Count	N=114
Type of Program	
Medical Assistant	38 (33%)
Respiratory Therapist	20 (18%)
Surgical Technician	15 (13%)
General Sonographer	14 (12%)
Medical Laboratory Technician	14 (12%)
Vascular Sonographer	8 (7%)
Pharmacy Technician	5 (4%)
Type of Institution	
Public College	74 (65%)
School	22 (19%)
For-profit	8 (7%)
Private College	6 (5%)
Hospital	2 (2%)
Other	2 (2%)
Degree Level	
Diploma/Certificate	40 (35%)
Associate Degree	64 (56%)
Bachelor's Degree	10 (9%)

criterion of including a diversity statement for the institution in which the program is housed. At the other end of the spectrum, less than 10 percent of programs met 4 criteria: including a program diversity statement ($n = 4$), an affinity group for women ($n = 9$), an affinity group for individuals with disabilities ($n = 4$), or an appointed leadership position addressing diversity ($n = 5$).

Three institutional types met our inclusion criteria and were included in the analysis: public colleges (PC) ($n = 74$), schools (S) ($n = 22$), and for-profit institutions (FPI) ($n = 8$) (Fig. 1). The number of website diversity criteria met differed significantly among them (median criteria met: 3 PC, 1 S, 1 FPI; $p < 0.0001$). More specifically, public college websites met a significantly higher number of criteria than schools ($p < 0.0001$) and for-profit institutions ($p = 0.03$). Schools and for-profit institutions did not differ significantly ($p = 0.99$).

Table 2: Diversity Criteria Met

	2 (1 - 4)
Total Criteria Met	min = 0 max = 10
Individual Criteria	
1. Photographs of minority individuals in any role	90 (79%)
2. Photographs of minority individuals in positions of authority	47 (41%)
3. Separate diversity statement	46 (40%)
4. Disability Coordinator contact information	38 (33%)
5. Diversity initiatives	26 (23%)
6. Diversity page/section	16 (14%)
7. Diversity groups - race/ethnicity	15 (13%)
8. Diversity groups - LGBTQ	12 (11%)
9. Diversity groups - women	9 (8%)
10. Appointed diversity leadership position	5 (4%)
11. Program diversity statement	4 (4%)
12. Diversity groups - disability	4 (4%)

Reported are median (Q_1 - Q_3) or count (%), unless otherwise labeled.

All degree levels met our inclusion criteria and were included in the analysis: diploma/certificate (D/C) ($n = 40$), associate degree (AD) ($n = 64$), and bachelor's degree (BD) ($n = 10$) (Fig. 2). The number of website diversity criteria met differed significantly among them (median criteria met: 1 D/C, 3 AD, 4.5 BD; $p = 0.0002$). More specifically, websites for programs at the diploma/certificate level met significantly fewer criteria than both bachelor's ($p = 0.003$) and associate ($p = 0.002$) programs. The number of criteria met did not differ significantly between bachelor's and associate degree level programs ($p = 0.46$).

Six program types met our inclusion criteria and were included in the analysis: medical assistant (MA) ($n = 38$), respiratory therapist (RT) ($n = 20$), surgical technician (ST) ($n = 15$), general sonographer (GS) ($n = 14$), medical laboratory technician (MLT) ($n = 14$), and vascular sonographer (VS) ($n = 8$) (Fig. 3). The number of website diversity criteria met did not differ significantly among them (median criteria met: MA-2, RT-3, ST-3, GS-2.5, MLT-3, VS-2.5; $p = 0.13$).

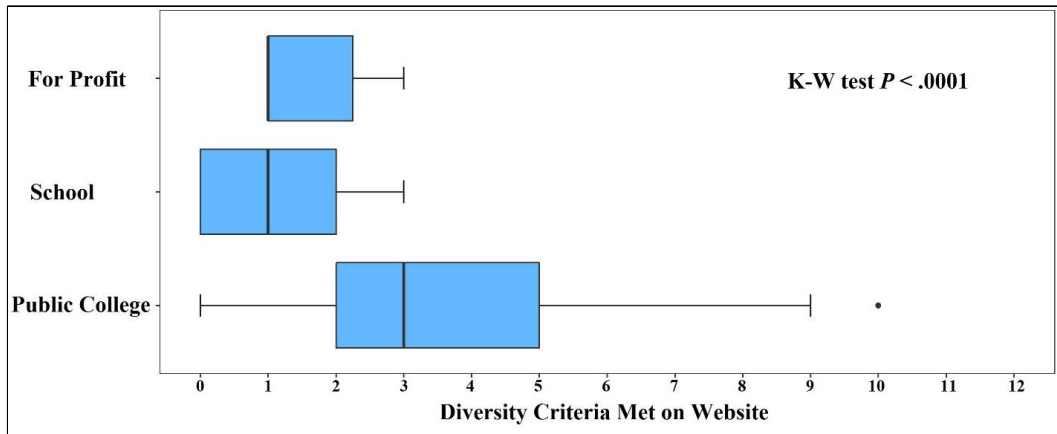


Figure 1: Diversity criteria met on website by type of institution

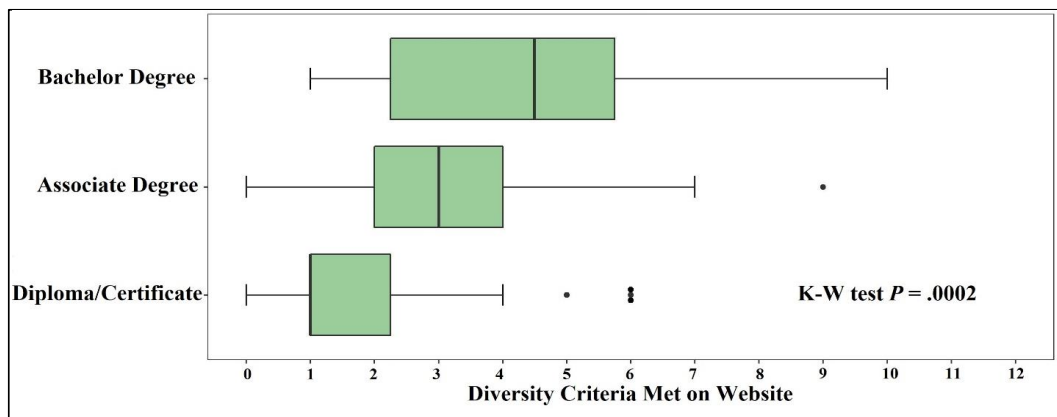


Figure 2: Diversity criteria met on website by degree level

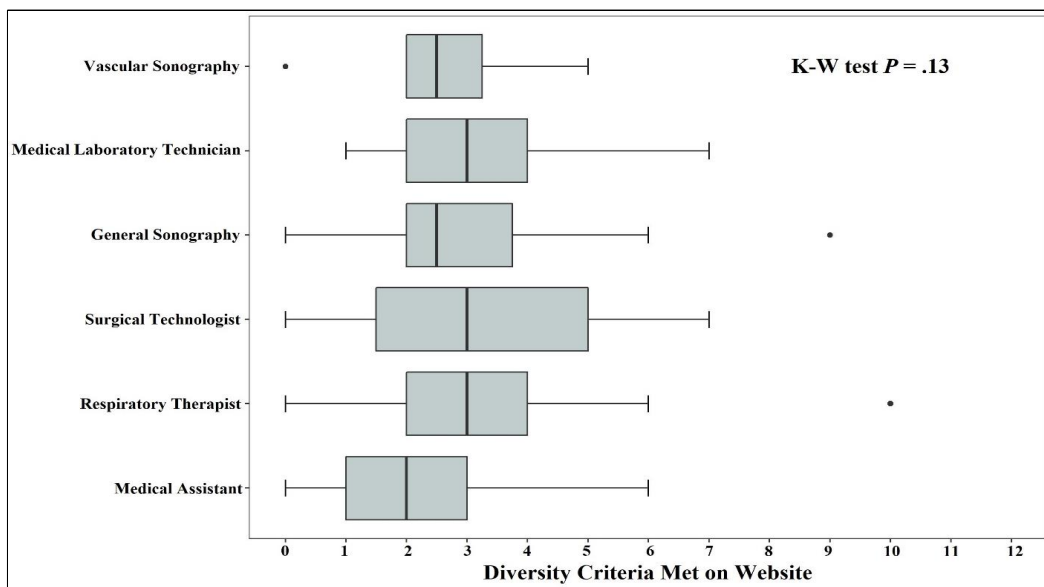


Figure 3: Diversity criteria met on website by program type

DISCUSSION

Our major finding—that HSE program websites do little to highlight diversity—is at odds with a major imperative in US healthcare today—the need to diversify the pool of health science workers. While the representation of diversity on a website may not equate with program diversity, it does reflect intention and demonstrates that the program places value on the diversity of potential students.

Consistent with earlier studies of other types of medical education programs (Driesen et al., 2020; Sanchez et al., 2021; Smith, L. V. et al., 2016; Smith, J. B. et al., 2021), most programs in our study met few of the website diversity criteria examined. The median number of criteria met by a single program was 2 of a possible 12, and we found no statistically significant difference based on program disciplines. In addition, the most common diversity criteria met were the easiest to achieve: 79 percent of program websites included an image of an individual from a community underrepresented in health sciences in any role, and 41 percent included an image of a minority individual in a position of authority. Posting a photograph requires no programmatic changes or a revised statement of values for the program or institution. Similarly, the third-most

common criterion met (40%) was a diversity statement for the institution, not a program-specific statement. Only four programs (4%) had their own diversity statement, suggesting that the vast majority do not prioritize communicating that diversity is a program value. Overall, the lack of diversity-related content on program websites suggests they either do not prioritize diversity or do not see the value in highlighting this commitment.

Programs at public colleges met significantly more of the diversity metrics—3, on average—than either for-profit training programs or schools, which both met, on average, 1. Bachelor's and associate degree programs met significantly more criteria than diploma/certificate programs did. While this result might suggest that the more selective, higher credential programs are doing the most to attract a diverse student population, it may instead reflect greater pressure to demonstrate their commitment to diversity. Although this study was not designed to ascertain the reasons for the observed differences among reviewed sites, all programs, particularly the least selective, lower credential programs, can use their websites to demonstrate their commitment to diversity and to broaden their appeal to potential students from communities underrepresented in the health sciences.

To our knowledge, our study is the first to evaluate HSE program websites' inclusion of diversity-related criteria. Our metrics cover a broad range of ways that programs can demonstrate their commitment to diversity. Certain criteria, such as program-related affinity groups, diversity initiatives, and a diversity-specific leadership position, suggest efforts at inclusion as well as diversity. However, inclusion efforts are generally behavioral and not readily measured by reviewing a website. Although diversity can mean different things to different institutions, our use of 12 criteria ensured capture of a broad spectrum.

We required that a metric be found on the program's website or within 1 click to reflect the priority the program placed on it and to recognize that potential students may be influenced by diversity metrics even if they would not seek them out. For most of the metrics, presence of the criterion can be assessed objectively. Diversity statements, whether program-specific or institutional, clearly ratify values as does a diversity leadership position or diversity-specific webpage. Diversity initiatives and affinity groups are also tangible evidence of commitment. While all recipients of federal financial assistance are required to identify their disability coordinator and expected to post this information somewhere on their website, making it readily accessible connotes its priority and expected need.

Our study has several limitations. First, a few metrics are subjective. Determining that images showed individuals underrepresented in the health sciences in any role or a position of authority was largely based on our perceptions of both ethnicity and position status (e.g. leader vs participant). Certain physical disabilities can be objectively identified in photographs but not most nor LGBTQ+ status. However, images connoting diversity were the most common metric met by the targeted websites and therefore too important to omit.

Second, our sample was confined to health science professions highly needed in Ohio, which may not generalize to other states, and is hardly exhaustive. In addition, the needs in Ohio may

change over time. Furthermore, high-need professions in other states may differ from those in Ohio, and our findings will require validation in other settings and over different time frames than the current study.

An opportunity for future study is to evaluate diversity representation on websites for nursing programs and health education programs at Historically Black Colleges and Universities (HBCUs). While both were beyond the scope of this study and we would expect greater representation of people underrepresented in medicine on HBCU websites, these sites have not, to our knowledge, been examined.

Our results show that the typical HSE program website leaves significant room for improvement in presenting the program's commitment to diversity. Communicating commitment is particularly weak among for-profit and school programs, which are often the most accessible for those who are underrepresented in the health professions. In addition to validating our findings in a broader sample of programs in Ohio and other states, future research should be designed to determine whether (a) presentation of diversity on an HSE program's website, diversity initiatives for recruiting and retaining students from underrepresented communities, and inclusion efforts are correlated; (b) the display of diversity on a program's website and the actual diversity of its student body are correlated; and (c) websites for nursing programs and HBCU HSE programs resemble these studies.

CONCLUSION

This analysis found that health science education program websites met 2 out of 12 diversity-related criteria. Programs at public colleges met significantly more than for-profit and school programs, and certificate/diploma level programs met significantly fewer than associate and bachelor's level programs. Our findings underscore the opportunity for health science education programs to demonstrate greater appreciation for diversity on their public websites, particularly the more accessible, as defined by their lower cost and shorter duration.

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Physical Therapist Assistant Education Program Practices to Enhance Student Diversity

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ABSTRACT

This study examined practices physical therapist assistant (PTA) education programs use to recruit students from underrepresented racial/ethnic groups. Directors were surveyed about program characteristics, the race and ethnic origin of enrolled students, strategies to recruit students from underrepresented racial/ethnic groups, and perceived barriers to their recruitment. We found that few PTA programs implement strategies to recruit and enroll students from underrepresented groups, and no program reported receiving specialized funding to do so. The most commonly cited reasons were the high number of applicants, no perceived need, lack of knowledge about effective strategies, and lack of faculty members and mentors of color. Moreover, among the programs that do implement such strategies, they have little effect, perhaps because they were mostly “one and done” activities, like career fairs, school visits, and information distribution. PTA education programs with faculty members of color had a significantly higher minority equity score for enrollment (MESE) than those that did not. We also found a strong positive relationship between the proportion of racial/ethnic minority group members enrolled in the PTA program and the proportion who reside in the county where it is located.

Keywords: ■ Diversity ■ Physical Therapist Assistant Education ■ Racial-Ethnic Minority ■ Recruitment ■ Underrepresented

Authors' Note: Portions of these findings were presented as a poster at the American Physical Therapy Association 2019 NEXT Conference and Exposition. We gratefully acknowledge the assistance of Hayley Skovira with data collection, Jennifer Valcin and Tyler Garner with statistical analysis, and Laura Cruz with manuscript review.

INTRODUCTION

Racial and ethnic health disparities persist in the United States. One strategy to reduce them is to increase the diversity of the healthcare and public health workforces (USDHHS, 2015). The physical therapy profession has affirmed its commitment to diversity; for example, one of the objectives in the American Physical Therapy Association's 2019-2021 strategic plan is to "foster the long-term sustainability of the physical therapy profession" by becoming an "inclusive organization that reflects the diversity of the society the profession serves" (APTA, 2020a). However, data indicate the profession still has significant work to achieve this objective (APTA, 2020c; CAPTE, 2018).

American Indian, Alaskan Native, Black/African American, and Hispanic/Latinx students are underrepresented in physical therapist assistant (PTA) education. In 2017-2018, their enrollment in PTA programs was as follows: .6 percent American Indian or Alaskan Native; 6.4 percent Black/African American; and 10.8 percent Hispanic/Latinx of any race (CAPTE, 2018). These percentages are low compared to the 2018 estimate of their percentages in the US population: 1.3 percent American Indian or Alaskan Native; 13.3 percent Black/African American; and 17.8 percent Hispanic/Latinx (US Census Bureau, 2018). Moreover, while the percentage of Hispanic/Latinx PTA students has increased modestly over the past 10 years, the percentages of the other underrepresented groups has remained relatively static (CAPTE, 2018).

A few studies have examined the variety and effectiveness of strategies to enhance physical therapist (PT) student diversity. Haskins and Kirk-Sanchez (2006) received 70 survey responses from program directors of Master of Physical Therapy (MPT) and Doctor of Physical Therapy (DPT) programs. About 71 percent of respondents reported special efforts to recruit and retain students from underrepresented racial/ethnic groups, and their median minority equity scores for enrollment (MESE) were higher than the no-effort groups', but differences were not statistically significant. The study identified the most frequently used strategies: participating in career fairs, reflecting cultural diversity as a program goal, and nonminority faculty participation in recruitment events, like high school visits. Few programs reported using faculty from racial/ethnic minority groups, likely due to their underrepresentation in PT education programs.

In 2013, the American Council of Academic Physical Therapy (ACAPT) created a Diversity Task Force (DTF), which surveyed ACAPT-member DPT program directors about their practices to recruit and retain students from underrepresented populations (ACAPT, 2016). Most respondents indicated that race and ethnicity were the only factors their PT education program used to identify applicants as underrepresented minorities. Their successful recruitment and retention was influenced by admissions, financial aid, institutional, and program-specific characteristics. Challenges included the geographic location of the program, competition from other health professions, admissions policies and procedures, and a lack of effective recruitment efforts (Wise et al., 2017). While the DTF distributed a modified version of the survey to PTA education

programs in the summer of 2014, data collected from this survey is not publicly available at this time.

Several recent studies have examined practices in medical and allied health education to recruit underrepresented minority students. Successful approaches include strategic outreach, engaging student recruiters of color, preadmission counseling, graduate admission test preparation programs, restructuring admissions procedures, intensive academic advising, one-on-one faculty mentoring, and enrichment programs (DiBaise et al., 2015; Figueroa, 2014; Snyder & Frogner, 2018). Many effective programs employ a combination of strategies (Kuo et al., 2015; Snyder & Frogner, 2018). Reported barriers include program location, other schools in the area targeting underrepresented students, and lack of time and financial resources, faculty members of color, peer or community support, qualified students, and student interest (DiBaise et al., 2015; Figueroa, 2014; Hunter, et al., 2015; Snyder & Frogner, 2018).

While these studies provide some insight into effective ways to recruit PTA students from underrepresented populations, most involved graduate-level programs. PTA programs are generally associate degree level, with different resources and student populations. No study had focused on their specific practices. Our study was designed to identify PTA education programs' current practices to recruit and enroll students from underrepresented racial/ethnic groups, assess their effectiveness, and understand perceived barriers to implementing effective strategies.

METHODS

This study was approved as exempt by the Pennsylvania State University Institutional Review Board. We developed a survey for PTA program directors, incorporating information from the literature (DiBaise et al., 2015; Figueroa, 2014; Haskins & Kirk-Sanchez, 2006; Kuo et al., 2015; Snyder & Frogner, 2018). It was distributed by email using Qualtrics Survey Software, opened on June 20, 2018, and closed on September 24, 2018. All 371 directors of CAPTE-accredited PTA programs listed in the online CAPTE database as of June 1, 2018 were emailed an initial request to participate. A follow up email was sent approximately four weeks later. Ultimately, 72 PTA program directors from 34 states responded to the survey, yielding a response rate of 19.4 percent. The survey asked respondents to identify the race and ethnic origins of students enrolled in their PTA programs as of October 1, 2017, as noted in the 2017 CAPTE Annual Accreditation Report (AAR), since only aggregate data is publicly available. It asked questions about the program's structure, geographical location, tuition, number of full-time faculty, number of full-time faculty of color, and whether it engages in special efforts to recruit and enroll students from racial/ethnic minority groups. If respondents indicated the program did, they were asked to select all strategies used from a list of 26. An open-ended question asked them to identify any of their strategies

that were not listed. The survey also asked about the relationship between the program's and the institution's recruitment efforts and funding for such activities.

If respondents indicated they did not participate in special efforts to recruit and enroll students from racial/ethnic minority groups, they were asked to select all applicable reasons from a list of seven. An open-ended question allowed them to identify reasons not listed.

DATA ANALYSIS

Analysis included frequency counts of efforts made to recruit students from racial/ethnic minority groups and use of external funding, along with the number of programs using each recruitment strategy and reporting each barrier. The percentage of responding PTA programs that engage in targeted efforts to recruit racial/ethnic minority students (effort group) was calculated and compared to the percentage of programs that do not (no-effort group). We also calculated the percentage of effort-group programs using each recruitment strategy and the percentage of no-effort group programs citing each reason for inaction.

We obtained the data estimating the race and ethnic origin of the population of each responding PTA program's county from the US Census Bureau. Shapiro-Wilk's test determined that the variables were not normally distributed ($p < .05$), so we used Spearman's rank-order correlation to determine any association between the percentage of racial/ethnic minority students in a PTA program and the percentage in the county where it is located. Using a method similar to that described by Richardson and Skinner (1990) and used by Haskins and Kirk-Sanchez (2006), MESE was calculated as the ratio of the proportion of racial/ethnic minority group members enrolled in the PTA program to the proportion in the county. A Mann-Whitney U test was run to determine whether MESE score differed between the effort and no-effort groups or between programs with and without racial/ethnic minority faculty. IBM SPSS Statistics Version 27.0.1 was used for all data analysis (IBM Corp, 2020).

RESULTS

Program Location

Out of our 72 respondents, 63 provided information about the location of their PTA education program (county and state) and the race/ethnic origin of enrolled students. The correlation between the two was strong, positive, and statistically significant ($r_s [61] = 0.723$; $p < .001$; see Fig. 1).

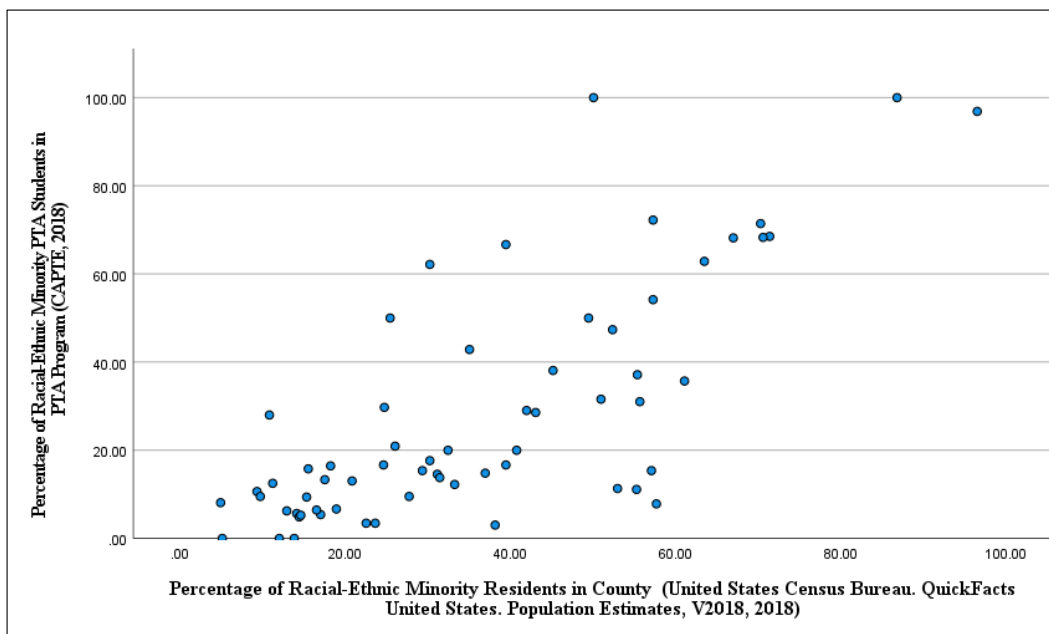


Figure 1: Correlation between the percentage of racial/ethnic minority students in a PTA program and in the county where the program is located

Recruitment Strategies

Approximately 38 percent (27/72) of respondents indicated that their program implements strategies to recruit and enroll students from racial/ethnic minority groups. Table 1 shows the most common were participating in career fairs (74%), organizing on-campus events about the program or physical therapy careers (70%), visiting high schools (67%), stipulating cultural diversity as a program goal (56%), participating in health fairs (52%), and disseminating pamphlets, brochures, and fliers (48%). No program reported receiving funding to support these activities.

Perceived Barriers

The most common reasons cited for no effort were the already high number of applicants (34%), no perceived need (32%), lack of knowledge about effective strategies (21%), lack of faculty members and mentors of color (21%), difficulty reaching the target populations (19%), and insufficient human resources (15%).

Table 1: Strategies PTA programs use to recruit students from racial/ethnic minority groups

Recruitment Strategy	Percentage of Effort Group Programs that Report Use
Participating in career fairs	74%
Organizing on-campus events about PT	70%
Visiting high schools	67%
Citing cultural diversity as a program goal	56%
Participating in health fairs	52%
Disseminating pamphlets, brochures, fliers	48%
Marketing educational support (tutoring, writing center etc.)	44%
Marketing minority-centered resources (black student union, cultural center)	44%
Reaching out to K-12	44%
Using minority students or alumni in recruitment activities	44%
Targeting financial awards to minority students	41%
Designing online program information to showcase and appeal to students from underrepresented groups	41%
Disseminating financial aid information	33%
Using nonminority faculty in recruitment activities	30%
Visiting middle or elementary schools	26%
Mentoring minority students	22%
Implementing service learning projects	22%
Using minority faculty in recruitment activities	22%
Keeping in touch with potential minority students	19%
Using current nonminority students or alumni in recruitment activities	19%
Providing pre-enrollment developmental courses	15%
Considering race or ethnicity in admissions decisions	7%
Visiting minority-serving institutions	7%
Providing pre-enrollment enrichment courses	7%
Targeting parents of minority students	7%
Other	7%

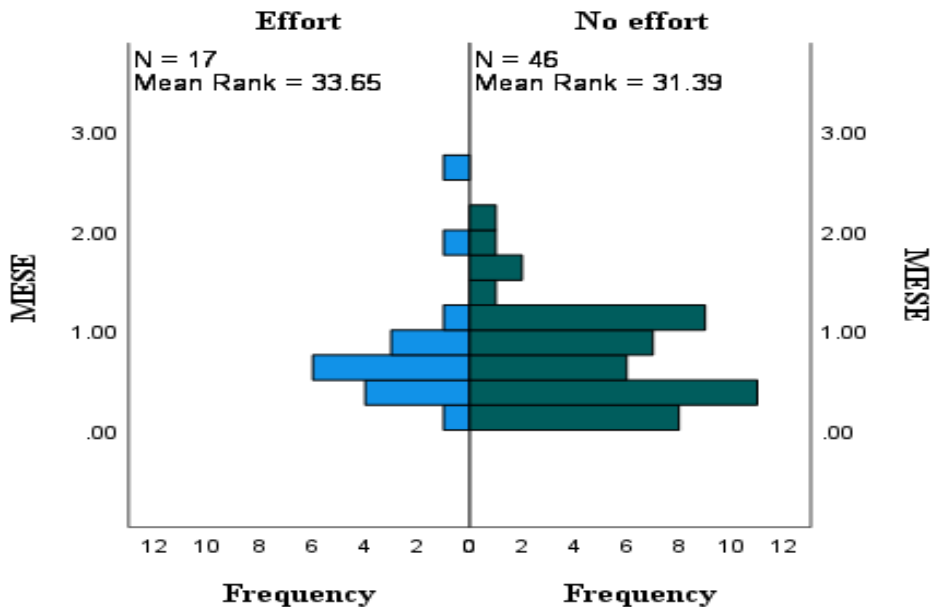


Figure 2: MESE scores for the effort and no-effort groups

Effect on Racial/Ethnic Minority Student Enrollment

A Mann-Whitney U test was run to determine whether MESE score differed between the effort and no effort groups. As Figure 2 illustrates, their distributions were not similar, but the difference (effort group mean rank = 33.65; no-effort group mean rank = 31.39) was not statistically significant ($U = 419$, $z = .434$, $p = 0.665$).

We also ran a Mann-Whitney U test to determine whether MESE scores differed between PTA education programs with and without faculty from racial/ethnic minority groups. As Figure 3 demonstrates, distributions were not similar; the difference between programs with minority faculty (mean rank = 41.77) and without (mean rank = 29.46) was statistically significant ($U = 452$, $z = .452$, $p = 0.031$).

DISCUSSION

American Indian, Alaskan Native, Black/African American, and Hispanic/Latinx students are underrepresented in physical therapy education. Though this disparity holds for both physical

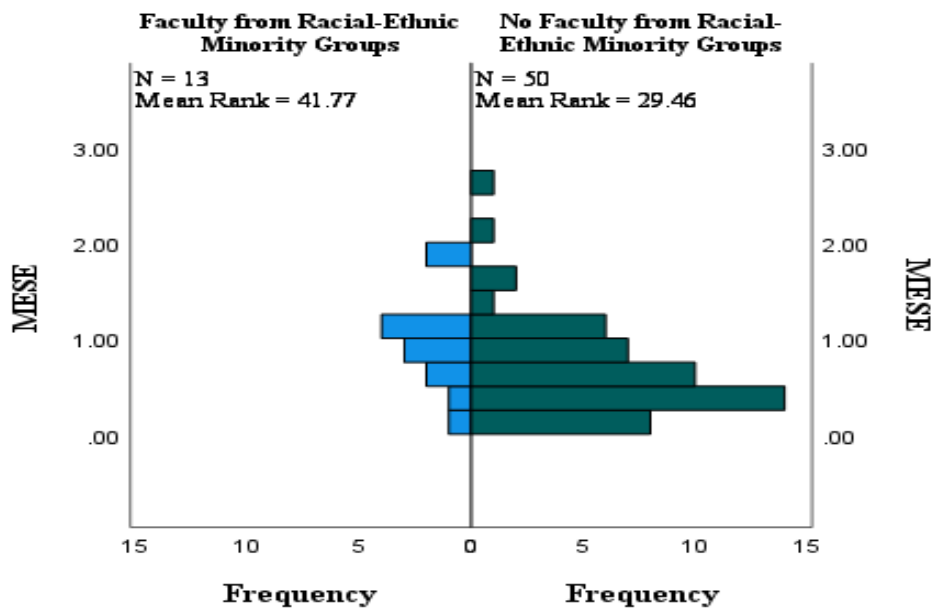


Figure 3: MESE scores for PTA education programs with and without faculty from racial/ethnic minority groups

therapist education and physical therapist assistant education, previous research has focused almost exclusively on physical therapist education. Physical therapist assistants play an important role in the delivery of patient care and education. Race concordance between patient and provider has been found to enhance the healthcare experience of persons of color by building trust and enhancing communication (Alsan et al., 2019). In addition, evidence suggests that White students participating in medical education programs with higher racial and ethnic diversity feel better prepared to care for diverse patient populations and express more positive attitudes about equitable access to healthcare (Saha et al., 2008). Healthcare providers of color are more likely to practice in underserved communities than their non-Hispanic White counterparts (Figueroa, 2014; Saha et al., 2008). Therefore, enhanced racial/ethnic diversity among physical therapist assistants would benefit physical therapy patients.

Even though the proportion of racial/ethnic minority group members enrolled in PTA education programs is significantly lower than their proportion in the US population, relatively few programs implement specific strategies to recruit and enroll them. Moreover, current common practices seem to have no significant effect. Interactions with potential students at career fairs, school visits, and through information distribution may be ineffective because they occur only

once or twice, with little or no follow-up. Studies examining underrepresented student recruitment and retention in healthcare programs indicate that intensive, long-term interventions like pre-enrollment developmental courses that prepare students for college-level coursework by developing their reading, writing, and mathematics skills, enrichment courses that offer learning experiences above and beyond those in a typical high school curriculum, and mentoring programs tend to yield positive results (DiBaise et al., 2015; Kuo et al., 2015; Snyder & Frogner, 2018). Very few PTA education programs report using such strategies, but because our sample size is small, the overall effectiveness of these strategies could not be determined.

The inclusion of faculty members from racial/ethnic minority groups may have a positive influence on underrepresented student enrollment, consistent with previous findings in DPT education programs (Nuciforo, 2015). However, American Indian, Alaskan Native, Black/African American, and Hispanic/Latinx faculty are underrepresented in both DPT and PTA education programs (CAPTE, 2020a; 2020b). The ACAPT Diversity Task Force recognized this disparity and the lack of programs or pathways to support minority graduates working to become DPT faculty and recommended several strategies, including the development of physical therapy faculty and clinical residency programs at HBCUs and Hispanic-serving institutions (HSIs) (ACAPT, 2016). However, the academic preparation and career trajectories of PTA and DPT faculty often differ. While many published studies examine the challenges of recruiting and retaining academic faculty of color, few focus on DPT faculty and none on PTA faculty, indicating an area for future research.

We found a strong positive relationship between the geographical location of the program and the proportion of racial/ethnic minority group members it enrolls. Proximity to home is often an important factor in a student's college choice, especially for racial/ethnic minority and economically disadvantaged students (Turley, 2009). Healthcare programs note that an institution's location can be a barrier to the matriculation of underrepresented students (Smith et al., 2009). Therefore, supporting PTA education programs in areas with large racial/ethnic minority populations could increase diversity among PTAs.

In addition, PTA educators must recognize and address perceived barriers to recruiting minority students. One commonly reported reason for not making an effort is no perceived need, but 85 percent of the programs citing this reason (11/13) had a MESE of .9 or higher. While some PTA programs are successful in recruiting a student population that reflects their local community, the data demonstrate that overall, the PTA student population is not representative of the US population.

Another commonly reported reason for no effort is the large number of applicants. PTA education programs should track their student demographics and MESE over time to measure their success in promoting a diverse PTA workforce. They may benefit from reassessing their admissions policies and procedures. For example, research has shown that including noncognitive factors in the application review process may increase diversity, benefiting both students and their future patients (Artinian et al., 2017; Wise et al., 2017).

Lack of faculty members and mentors of color and insufficient human resources were other frequently cited barriers. PTA programs generally have fewer faculty members and resources than Bachelor's and graduate-level medical and allied health education programs. PTA education programs may need innovative strategies and partnerships with DPT education programs, other health professional education programs, local nonprofit organizations, and local districts and chapters of the APTA to provide meaningful PTA career exposure and preparation experiences.

Finally, many programs reported a lack of knowledge about effective strategies. Research to determine and disseminate effective practices is urgently needed.

This study has several limitations. It assessed student enrollment only as of October 2017, so inferences about other years demand caution. In addition, it demonstrated the association of variables, but a causal relationship cannot be inferred. The response rate was less than 20 percent, so the trends discussed may not be generalizable. Additional investigations should focus on PTA programs' efforts to recruit and enroll other underrepresented students as defined by APTA, including students from geographically underrepresented areas, lower economic strata, educationally disadvantaged backgrounds, and with disabilities. (APTA, 2020b). PTA programs do not commonly collect or report this information. Finally, the recent COVID-19 pandemic and social justice movements advocate for diversity, equity, and inclusion in healthcare. A follow-up study in a few years would help to determine changes in PTA program recruitment practices.

CONCLUSION

This study demonstrates a need for ongoing research and enhanced efforts to increase diversity in PTA education programs. Effective recruitment, enrollment, and retention strategies must be identified and implemented to foster a physical therapy workforce more representative of the population served. Programs that do implement specific strategies should collect and share data to promote effective, evidence-based approaches. Programs that do not should investigate how well their student population meets community needs.

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A Descriptive Analysis of Comfort Level and Actions of Certified Athletic Trainers toward LGBTQIA+ Identifying Individuals

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ABSTRACT

Bullying, harassment, and discrimination plague people identifying as lesbian, gay, bisexual, transgender, queer, intersex, and/or asexual (LGBTQIA+) throughout society, but no research has examined the prevalence of oppressive treatment in athletic training. This study identified athletic trainers' comfort levels with LGBTQIA+ and responses to bullying. A total of 792 (She, n = 462[58.3%]; He, n = 321[40.5%]; They, n = 8[1%]; Ze, n = 1[0.01%]) athletic trainers completed the 9-item LGBT Attitudes and Environment Survey (LGBTAES), which assesses comfort with LGBTQIA+ and willingness to speak up when witnessing bullying. Descriptive data indicated that most felt comfortable around LGB patients, felt less comfortable with transgender patients, and were willing to speak out against bullying. Athletic trainers identifying as she/her/hers are more comfortable with LGBTQIA+ and more likely to speak up when witnessing bullying. Patient-centered care is the first priority in any athletic training facility, and bullying, harassment, or discrimination against any patient or colleague, regardless of gender identity is unacceptable.

Keywords: ■ Athletic Trainers ■ Bullying ■ Discrimination ■ LGBTQIA+ ■ Workplace

INTRODUCTION

A fundamental purpose of athletic training is to provide patient-centered care (BOC, 2021; NATA, 2021). Sensitivity should extend to all patients, including those identifying as lesbian, gay, bisexual, transgender, queer, intersex, and/or asexual (LGBTQIA+). However, discrimination, bullying, and harassment toward this population are pervasive in the workplace. Many contribute to these actions; others observe and do nothing (Baker & Lucas, 2017; Crossway, Rogers, Nye, Games, & Eberman, 2019; Garcia Johnson & Otto, 2019; Sheridan, Zolobzcuk, Huynh, & Lee, 2017; Whitfield, Kattari, Langenderfer-Magruder, Walls, & Ramos, 2019). Prevalence of anti-LGBQ harassment can range from 15 to 66 percent, depending on the social setting (Whitfield et al., 2019). Racial/ethnic minority LGBQ adults endure higher rates of harassment than White LGBQ adults (Whitfield et al., 2019).

Bullying and harassment are nothing new in society. The Workplace Bullying Institute's 2017 US Workplace Bullying Survey found that 19 percent of Americans have suffered abuse at work; another 19 percent have witnessed it; and 63 percent are aware that it happens (Namie, 2017). Verbal victimization behaviors serve to "underscore status differences . . . [and] reaffirm existing hierarchies among different social categories" (Collier, Bos, & Sandfort, 2013). One study found that while the bullying rate for heterosexuals over a six-month period was 6.4 percent, the rate tripled for bisexuals (19.2%), and more than doubled for lesbians (16.9%) and gays (13.7%); 90 percent of a transgender sample reported harassment, mistreatment, or discrimination on the job (Garcia Johnson & Otto, 2019). Sadly, while the Hate Crimes Prevention Act (HCPA) criminalizes behavior that causes "bodily injury" based on someone's "actual or perceived religion, national origin, gender, sexual orientation, gender identity, or disability," it does not address emotional harm (Olsen, n.d.). Research demonstrates that LGBTQ workers may suffer psychologically and professionally due to hostile workplaces (Muñoz & Thomas, 2006). Co-workers may not always be aware of their negative actions toward others. Implicit biases—attitudes that affect our actions, understanding, and decisions (Moffit, Mansell, & Russ, 2020)—and microaggressions—brief, daily, verbal, behavioral, or environmental indignities (Baker & Lucas, 2017)—may harm LGBTQIA+ simply because protections are not in place (Baker & Lucas, 2017).

Bullying and harassment begin early. Sexual minority youth face physical/verbal abuse, rejection by friends and family, including being disowned, and family violence (Bishop & Casida, 2011). A survey of high school students found that 98 percent have heard such words as fag, queer, dyke, homo, or gay at school and 51 percent report hearing them on a daily basis (Bishop & Casida, 2011). Educators admit to observing the harassment. In one study, 90 percent of the educators surveyed reported observing LGBTQ harassment, but only 30 percent reported intervening to curb the behavior (Dragowski, McCabe, & Rubinson, 2016).

Researchers have explored harassment and attitudes toward LGBTQIA+ across four human service occupations—mental health, medicine, education, and public and private government-

related nonprofit community organizations (Sheridan et al., 2017). Among them, education professionals encountered the highest incidence of verbal and physical harassment directed toward LGBT individuals and felt the least prepared to handle it, despite being the most likely to speak-up against it. Medical professionals reported receiving the least training on LGBT-related contact. Discriminatory attitudes and environments toward LGBT differed with their race/ethnicity and gender.

In a 2011 survey of LGBT athletes, nearly 30 percent reported having been harassed or physically assaulted as a result of their sexual orientation or gender expression while participating on a sports team (Ney, Eberman, & Armstrong, 2017). National Collegiate Athletic Association (NCAA) trainers were surveyed to examine their positive or negative attitudes toward lesbian, gay, and bisexual student-athletes. Over half (58.5%) reported having worked with student athletes who were lesbian, gay, or bisexual, and upon completion of the Attitudes toward Lesbians, Gay Men, and Bisexuals (ATLGB) scale, 85.4 percent scored in the “positive” or “somewhat positive” range with only 14.6 percent scoring in the “somewhat negative” or “negative” range. A survey of NCAA athletes showed positive perceptions of athletic trainers who identified as LGBTQ (Crossway et al., 2019).

Based on these studies, we must consider how workplace environments address the harassment and bullying of both employees and the patients they care for. Attitudes toward harassment and bullying of LGBTQIA+ have been investigated in healthcare professions but not the athletic training profession. This exploratory study was designed to identify whether differences in the age, pronoun used, and/or race/ethnicity of athletic trainers affected their comfort level with LGBTQIA+ and their actions when those individuals are bullied or harassed.

METHODS

Participants and Sample

For inclusion, athletic trainers had to be certified and a member of the National Athletic Trainers' Association (NATA). An invitation to participate was sent to 10,951 certified NATA members via the NATA Research Survey Service; 792 (7.2% response rate) completed the survey.

Procedures

Emails consisted of a consent form (completion and submission of the survey were considered implied consent) and a link to the LGBT Attitudes and Environment questionnaire (Table 1). After the initial email, participants received three reminder emails to complete the questionnaire every two weeks over eight weeks. Data were compiled using Qualtrics (Qualtrics Lab, Inc, Provo,

Table 1: LGBT Attitudes and Environment Survey and Results

Item	Question	Results	M (SD)
1	Comfort level with those identifying as gay, lesbian, or bisexual	Very Comfortable n=426 (53.8%) Comfortable n=160 (20.2%) Neither Comfortable, nor Uncomfortable n=66 (8.3%) Uncomfortable n=13 (1.6%) Very Uncomfortable n=3 (0.03%) Did not answer n=124 (15.7%)	1.50 (0.77)*
2	Comfort level with those identifying as transgender	Very Comfortable n=191 (24.1%) Comfortable n=274 (34.6%) Neither Comfortable, nor Uncomfortable n=125 (15.8%) Uncomfortable n=49 (6.2%) Very Uncomfortable n=18 (2.3%) Did not answer n=135 (17%)	2.12 (0.99)*
3	Previously attended public educational talks on gender and orientation topics	No n=332 (41.9%) Yes n=358 (45.2%) Did not answer n=102 (12.9%)	1.52 (0.5)
4	Uses anti-gay words or jokes to tease others	No n=626 (79%) Yes n=45 (5.7%) Did not answer n=121 (15.3%)	1.06 (0.24)
5	Knowledgeable about the specific challenges facing youth and families regarding gender and discrimination	No n=185 (23.4%) Yes n=504 (63.6%) Did not answer n=103 (13%)	1.74 (0.44)
6	At workplace, has heard verbal slurs (e.g., faggot, dyke, that's so gay) based on anti-gay attitudes	No n=381 (48.1%) Yes n=294 (37.1%) Did not answer n=117 (14.8%)	1.44 (0.5)
7	At workplace, has heard of physical harassment or physical bullying based on anti-gay attitudes	No n=599 (75.6%) Yes n=75 (9.5%) Did not answer n=118 (14.9%)	1.11 (0.31)

Table 1: LGBT Attitudes and Environment Survey and Results (*continued*)

Item	Question	Results	M (SD)
8	When possible, has spoken up when someone is bullied with gender-based or anti-gay slurs	No n=179 (22.6%) Yes n=514 (64.9%) Did not answer n=99 (12.5%)	1.76 (0.43)
9	Feels equipped to handle a situation that could arise regarding gender or orientation	No n=200 (25.3%) Yes n=489 (61.7%) Did not answer n=103 (13%)	1.72 (0.45)

*Q 1, 2 were scored on a 5-point Likert scale and ranged from 1 (*very uncomfortable*) to 5 (*very comfortable*).

UT) through the NATA Research Survey Service and exported into Microsoft Excel for analysis and safe storage. This project was approved by the Idaho State University Institutional Review Board (IRB) and considered exempt.

Instrumentation

LGBT Attitudes and Environment Survey (LGBTAES). The study used a nine-item, self-report survey developed and validated to measure personal and workplace attitudes regarding LGBT people (Sheridan et al., 2017). A 5-point Likert scale ranging from 1 (very uncomfortable) to 5 (very comfortable) was used for items 1 and 2. The scale for items 3-9 was yes or no. Items assessed such topics as comfort with LGBT-identifying individuals; hearing or using verbal slurs against them; awareness of the challenges they face; and willingness to speak up when witnessing bullying of an LGBT-identifying individual.

Data Analysis

Descriptive statistics for demographic data collected included age, pronouns, and race/ethnicity. Mean and standard deviations associated with the LGBTAES were calculated using Excel software (Version 16.57, Microsoft). Frequencies of age, pronoun, and race/ethnicity were also calculated using Excel.

RESULTS

Table 1 shows the results for each question. Table 2 summarizes participant demographics. While 74 percent (n = 586) responded “very comfortable” or “comfortable” and less than 2 percent “uncomfortable” or “very uncomfortable” with LGB, 68.7 percent (n = 465) responded “very comfortable” or “comfortable” and 8.5 percent (n = 67) “uncomfortable” or “very uncomfortable” with individuals identifying as transgender. The numbers who had attended (45.2%; n = 358) and not attended (41.9%; n = 332) public educational talks on gender and orientation topics were comparable. Despite this even split, 63.6 percent (n = 504) reported having knowledge about the challenges LGBTQ+ youth and their families face. A large percentage of participants denied using anti-gay words or jokes to tease others (79%; n = 626) and hearing or seeing physical harassment or physical bullying of LGBTQIA+ in the workplace (75.6%; n = 599). However, roughly equal numbers reported hearing or not having heard verbal slurs based on anti-gay attitudes (faggot, dyke, that’s so gay): 48.1 percent (n = 381) no and 37.1 percent (n = 294) yes. When possible, 64.9 percent (n = 514) of respondents spoke up when someone was bullied with gender-based or anti-gay slurs, and 61.7 percent (n = 489) feel equipped to handle such situations.

DISCUSSION

Understanding LGBTQIA+ bullying in the workplace is important for promoting equality and creating a safe environment for both employees and patients. Despite the importance of a safe space for patient-centered care, our study demonstrates that harassment occurs in athletic training, and some athletic trainers do not feel comfortable around LGBTQIA+. LGBTAES results show that as a profession, we have more work to do. The research demographics of race, age, and pronouns are similar to those used in previous studies (Ensign, Yiamouyiannis, White, & Ridpath, 2014; Sheridan et al., 2017), and the survey provides a general representation of what athletic trainers believe, but more research on their association is needed.

Some findings are positive. Regardless of their race, age, or the pronoun they use, 74 percent of respondents were aware of the gender and orientation challenges facing youth and parents. A much higher percentage of athletic trainers reported willingness to speak up when witnessing bullying of LGBTQIA+ individuals (68-81%) than did educators (30%) in another study (Dragowski et al., 2016). This higher percentage may be related to the supportive, caring, and compassionate climate of athletic training facilities, which conveys significant emotional benefit for LGBTQ+ (McCabe et al., 2013). In contrast, 281 respondents (43%) reported hearing verbal slurs based on anti-gay attitudes at their workplace; any number over zero should be concerning.

Reported comfort levels (very comfortable or comfortable) with those identifying as transgender (59-79%) align with previous reports (Ensign et al., 2014; Sheridan et al., 2017) but were

Table 2: Study Demographics

Study Characteristics	n	%
Age of Respondents		
20-24	45	5.68
25-29	159	20.08
30-34	119	15.03
35-39	104	13.13
40-44	80	10.1
45-49	94	11.87
50-54	81	10.23
55-59	53	6.69
60-64	35	4.42
65-69	18	2.27
70+	4	0.51
Pronoun		
She	462	58.33
He	321	40.53
They	8	1.01
Ze	1	0.13
Race/Ethnicity		
Prefer not to answer	53	6.69
Other	164	20.71
Multi-ethnic	26	3.28
Middle Eastern	2	0.25
Hispanic American	30	3.79
European American	475	59.97
Asian American/ Pacific Islander	16	2.02
African/Caribbean American	26	3.28

higher for those identifying as LGB (79-94%) and higher than previously reported levels. Athletic trainers identifying as she/her/hers were more comfortable with individuals identifying as LGBT. Research related to negative attitudes toward homosexuals among whom reported similar findings (Ensign et al., 2011). Knowing that athletic trainers generally are aware of the challenges and hear racial and anti-gay slurs, yet men and women show an approximately 20 percent difference in their comfort level with those identifying as LGB or T is discouraging. However, one study found that some athletic departments believe in diversity and inclusion as the norm (Cunningham, 2015), and their environment may extend to their trainers as well.

What can the athletic trainer do to stop bullying, harassment, and/or discrimination based on gender or gender identity? Become leaders. Jill Geisler (2019) describes steps for becoming an ally in the workplace. First, recognize how much you do not know and educate yourself. Be willing to learn. Understand the dangers of implicit bias and that microaggressions can have outsized effects. Second, act both proactively and reactively. Be more than a mentor. Finally, step out of your comfort zone. In atmospheres of trust, employees are more productive, creative, collaborative, and collegial (Geisler, 2019).

Limitations

The results represent descriptive data only. It was also self-reported; people who are cruel might have no problem lying about it. The questions did not discriminate whether the verbal slurs heard or bullying witnessed came from co-workers or patients. Only a small percentage of athletic trainers participated (7.2% response rate), probably due to the sensitivity of the subject, which renders generalization difficult.

Implications

This study represents a small percentage of working athletic trainers, but it demonstrates that the majority feel comfortable around LGB patients. Though less comfortable with transgender patients, more contact with them and taking advantage of education may help athletic trainers to provide high levels of care to all patients they treat. We should stand up to bullying whether we are comfortable with the individual under assault or not. Understanding will drive future education to improve patient-centered care.

CONCLUSION

Bullying and discrimination toward LGBTQIA+ are a concern in all professions. Healthcare providers have a particular responsibility to ensure a safe environment, not only for their patients,

but for co-workers. By being cognizant of words and behaviors, a workplace environment of care and safety can be created. Athletic trainers who are comfortable with how anyone identifies and willing to speak out against bullying and not tolerate it in any form make a strong contribution. Such advocacy must extend to co-workers. What others see in actions and words demonstrates the importance of treating all individuals with empathy and care.

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Teaching Concepts of Diversity, Inclusion, Cultural Competence, and Cultural Humility through Learning Experiences in Healthcare Curricula

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ABSTRACT

Diversity education promotes leadership, critical reasoning, and cultural understanding, leading to improved healthcare outcomes for all. To prepare for an increasingly multicultural population, healthcare students must learn how best to demonstrate diversity, inclusion, cultural competence, and cultural humility. This second study of a three-part series examined learning experiences that contained these four primary terms previously identified and mapped to learning outcomes/course objectives or other syllabi content. From 79 eligible learning outcomes/course objectives and six other syllabi content, 75 learning experiences were requested and 49 received from 20 courses met the criteria of using the primary terms or related words. Many courses combined the seven identified types of learning experiences-traditional lecture, reading, role playing, case studies, experiential learning, group learning, and psychomotor skill development to teach and emphasize topics relevant to diversity education but clearly lacked use of the primary terms. One learning experience used the keyword *diversity*, and 25 used variations or related words/phrases representing concepts affiliated with the four primary terms. These findings argue for introducing and reinforcing diversity education explicitly throughout healthcare curricula.

Keywords: ■ Cultural Competence ■ Cultural Humility ■ Diversity ■ Inclusion ■ Learning Experiences

INTRODUCTION

Research demonstrates the importance of diversity education and experiences in preparing the healthcare workforce to meet the wide range of human needs. In their literature review, Kulik and Roberson (2008) report that diversity education has positive effects on participant knowledge of diversity issues in classroom and laboratory settings as well as workplace healthcare delivery. Gurin, Dey, Hurtado, and Gurin (2002) found that a diverse curriculum and experiences with diverse peers positively influences autonomous student outcomes, intellectual engagement, motivation, and citizenship engagement. According to Hurtado, Mayhew, and Engberg (2003), students who completed a diversity course showed better moral reasoning than peers who did not. Diversity courses have been associated with reductions in racial prejudice (Chang, 2002; Gurin, Nagda, & Lopez, 2004; Hurtado et al., 2003) and improved critical thinking (Chang, 2002; Hurtado et al., 2003; Pascarella, Palmer, Moye, & Pierson, 2001; Villalpando, 2002). Diverse engagement within a student body was found to guide cognitive and personal growth by promoting leadership abilities; critical, deep, and active thinking; cultural knowledge; and cultural understanding (Antonio, 2001a; 2001b; Antonio et al., 2004). Over the long term, courses that explicitly address the keywords diversity, inclusion, cultural competence, and cultural humility or related words/phrases guide students toward working effectively and efficiently with diverse populations (Bendick, Egan, & Lofhjelm, 2001; Hurtado et al., 2003).

This study explored the presence of those keywords, variations thereof or related words/phrases in learning experiences previously identified in learning outcomes and course objectives or other syllabus content of healthcare curricula in a study by Brown, Spicer & French (2021). The Human Resources Department at a midwestern university where the research took place developed a definition of diversity in conjunction with the Office of University Equity and Civil Rights Compliance (ECRC) and the Division of Diversity and Inclusion. It has broad ramifications for not only recruiting students, faculty, and staff, but educating them (Equal Employment and Educational Opportunity 40.001, 2020). It defines diversity components as race, color, religion, age, ethnicity, national origin, national ancestry, sex, pregnancy, gender, gender identity or expression, sexual orientation, military service or veteran status, mental or physical disability, or genetic information. The inclusion of pregnancy, military service or veteran status, national ancestry and origin, and genetic information distinguishes the university's definition from those described by Bleich, MacWilliams, and Schmidt (2015), Mazur (2010), and Smith (2016). Additionally, the university's 2018-2019 Diversity and Inclusion Annual Report emphasized inclusivity as an important component of the campus environment initiative, citing campus-wide efforts to "promote inclu-

sive institutional policies, practices, and cultures through intersectional programs and initiatives, as well as strategic communication and advocacy” (Division of Diversity and Inclusion, 2019, p. 6). However, the definitions of diversity and inclusivity were not specifically tied to curricula and instruction. Furthermore, the university did not develop a comprehensive definition of cultural competence or cultural humility to guide instruction.

The university’s health sciences college (CHSP) offers a healthcare cultural competency course that integrates five constructs: cultural awareness, cultural desire, cultural encounters, cultural knowledge, and cultural skill (Campinha-Bacote, 2002). It approaches cultural competence from the perspectives of both practitioner and the patient, describes the various cultural factors that can influence healthcare quality, and considers the importance of overcoming cultural barriers between healthcare team members to provide the best patient care. However, it is not required for all health professions majors and awards credit to undergraduates only.

Instruction should also consider the importance of cultural humility in higher education and the workforce. Cultural humility is the “ability to maintain an interpersonal stance that is other-oriented (or open to the other) in relation to aspects of cultural identity that are most important to the client” (Hook, Davis, Owen, Worthington, Jr., & Utsey, 2013, p. 2). A pilot study conducted by Paparella-Pitzel, Eubanks, and Kaplan (2016) demonstrated that a thoroughly planned educational experience focused on cultural humility and competence for as little as two hours was able to change student assessment results from culturally incompetent and unaware to culturally competent and aware for the next one-and-a-half years. Strategies must shift from teaching the components of diversity education, such as cultural competence and humility, in one course to weaving them through all undergraduate and graduate courses in learning experiences designed to achieve learning outcomes.

To see real change, academic affairs offices should direct efforts to address the lack of diversity education in curricula and instruction, but they will require evidence to justify them. No study had searched descriptions of healthcare courses’ learning experiences for the four keywords and/or related words/phrases. The following analysis will show how diversity terms are taught and conveyed to students and whether they are mapped to diversity-related learning outcomes and course objectives. It will set a precedent for improving learning experiences used to infuse diversity education into healthcare courses, thus preparing graduates to work with diverse populations.

METHODS

Rationale and Setting

This study is the second of a planned three, with the third addressing assessment. The first identified keywords and related words/phrases in learning outcomes, course objectives, and other syllabus con-

tent (Brown et al., 2021). Like the first, the second uses an exploratory framework to identify whether these keywords and related words/phrases appear in descriptions of learning experiences (Behrens, 1997). Its qualitative retrospective design did not require participant enrollment; the data represent diversity terms used in descriptions of learning experiences, learning outcomes, course objectives or other syllabus content in all in-person, classroom-based undergraduate and graduate CHSP courses with an enrollment greater than five offered on the main campus in fall 2019.

Sampling Strategy

Learning outcomes, course objectives and syllabi content from 32 previously independently reviewed syllabi were used in this phase of the study. Learning outcomes and course objectives that contained the words *diversity*, *inclusion*, *cultural competence*, *cultural humility* and any of the following variations: cultural, culturally, culture, cultures, multicultural, cultural competencies, culturally competent and diverse were deemed eligible to request learning experiences as were the following related words or phrases: stereotype, ethics/ethical, and social determinants of health. The following words or terms representative of diversity were also eligible: age/aging, child, children, adolescents, older adults, elder, woman/women, health conditions, and work experiences reflected by interdisciplinary health teams, interprofessional practice, health professions, professionals, healthcare providers/professionals, and healthcare practitioners (Brown et al., 2021). The acronym LGBTQ in a course objective was eligible as were three other words (communication, diversity and culture) found in syllabi content. This was a purposive sampling method because 79 syllabi learning outcomes and course objectives and six syllabi content were appropriate to request learning experiences (Brown et al., 2021).

Data Collection

This pilot study was approved by the university's Institutional Review Board. Data collection commenced in January 2020 and officially ended on June 30, 2020. It consisted of obtaining learning experiences that addressed the learning outcomes and course objectives or other syllabus content. If outcomes or objectives and/or other content met criteria for keywords and or related words/phrases, then instructors of record (IoRs) were sent a set of instructions. They were asked to submit learning experiences related to the outcomes or objectives or other syllabus content that were not graded activities. If there were three or more eligible outcomes or objectives and or syllabus content, they were asked to submit two learning experiences of their choice. The IoRs emailed to the principal investigator (PI) the learning experiences in a word document which were thereafter reviewed and analyzed. We solicited faculty participation through an announcement by the dean and email messages to department chairs. We sent a second reminder to submit the learning experience(s) May 2020. No incentives were provided for participation (see Brown et al., 2021, for more detail).

Verification of Validity and Reliability

Triangulation and peer review were used to confirm validity (Marshall & Rossman, 2011). In triangulation, two researchers independently used an established coding process to confirm the use of the keywords and/or related words/phrases in the learning experience and their connection to the learning outcome, course objective, and/or other syllabus content. Saturation was determined when the same or no new words/phrases appeared in those learning experience documents (Marshall & Rossman, 2011). Peer review consisted of a discussion to assure coding consistency and confirm that the words of interest appeared in the learning experience.

Maintaining an audit trail and a journal to reflect on emotions that may interject bias were methods to assure data collection and analysis reliability (Marshall & Rossman, 2011). Data analysis guidelines for this phase of the research process were established, modified and updated with justifications for doing so via an audit trail. Each researcher maintained a written journal to address potential biases regarding accepting or rejecting words of interest and again, documented justifications for including or excluding learning experiences which were later discussed for researcher agreement.

Data Analysis

Learning experiences were reviewed to determine the presence of keywords or related words, whether their subject matter mapped to learning outcomes, course objectives, and or other syllabus content, and the instructional format of those learning experiences which would be later mapped to assessments in part three of this research series. Researchers discussed findings and agreed to include or exclude the learning experience based on qualifying or disqualifying criteria. If the researchers did not understand the learning experience content, an email asking for clarification was sent to the IoR. Next, the instructional method was documented. The dates learning experiences were obtained, analyzed, and classified as the type of instructional method were documented in the database for future reference.

RESULTS

From the 85 learning outcomes, course objectives, and other syllabus content previously examined, representing 32 courses in phase one (Brown et al.,2021), we requested 75 related learning experiences. Instructors of nine courses chose not to participate; one course (NUTR4) was eliminated from the data analysis because the PI inadvertently omitted a request for a learning experience which had an eligible learning outcome/course objective; and last, eight other learning experiences were not requested despite having eligible learning outcomes/course objectives because the PI requested two of three eligible learning experiences. The final data set was com-

prised of 50 learning experiences from 20 courses, or a 67 percent response rate. The courses were in Communication Sciences and Disorders (CSD; n = 4), Exercise Physiology (EXPH; n = 6), Interdisciplinary Health Studies (IHS; n = 8), Nursing (NURS; n = 6), Nutrition (NUTR; n = 7), and Physical Therapy (PT; n = 19). Of the 50 learning experiences received, 49 (98%) met study criteria (see Table 1).

Appendix 1 denotes the eligible learning experiences, which contained the keyword *diversity* in practice (CSD2; n = 1) and nine instances of keyword variations: *diverse populations* (NURS1; n = 1); *cultural competency* and *culturally competent* (NURS1; n = 2); *cultural biases* and *cultural/linguistic* (CSD2; n = 2); *cultural beliefs* and *cultural differences* (IHS2; n = 2); *cross-cultural* nursing considerations (NURS1; n = 1); and *religious/cultural* aspects of diet (NUTR3; n = 1). In 16 instances (32%), related words or phrases were used: *culture* (NURS1; n = 1), *ethical* (EXPH6; n = 1; NURS6; n = 2), *stereotypes* (IHS1; n = 1), and *intersectionality* (IHS1; n = 1). *Cultural knowledge*, a component of cultural competence, was implied in a learning experience (PT2; n = 1) involving interaction with persons who are deaf. The text read: "Preferably, ask the deaf person - they are the expert on their own life." The word *diversity* was often implied through personal descriptors, such as race, age, gender, medical diagnosis, physical abilities/characteristics, and/or lifestyle pertaining to healthcare service delivery in EXPH2 (n = 1), EXPH3 (n = 1), IHS2 (n = 1), NURS6 (n = 1), and NUTR2 (n = 3) and related concepts of culture as described by personal characteristics in NUTR3 (n = 2) (see Appendix 1, column 4).

Of the 49 eligible learning experiences, 22 (49%) were mapped to the learning outcomes, course objectives or syllabus content as demonstrated by the continuity of keywords and/or related words/phrases. Appendix 1, column 2 lists the numbered outcome/objective from the syllabus or the week and date of the learning experience; column 3 notes the terms found in the outcome, objective, or other syllabus content. Column 4 describes instructional materials and formats, including traditional lecture, reading assignments, role playing, analysis of case studies, informal learning-by-doing, group learning, and psychomotor skill development. Many learning experiences combined these methods.

Traditional Lecture

Lecture delivery varied. Instructors used Microsoft Word® or PowerPoint® documents to provide examples and explain keywords and/or related words/phrases. Some Microsoft PowerPoint® presentations included questions to ascertain students' comprehension levels using situational content that exemplified the topic (EXPH2, Section 101). Acronyms were used to represent the content and subsequent actions to follow associated with psychomotor skills or key behaviors to be displayed. For example, SBAR: S=situation, B=background, A=assessment, and R=recommendation was emphasized using bullet points to explain information exchange when working with an interpreter

Table 1: Identifiable Learning Experience Items

Program	Eligible Course Syllabi	Eligible Course Learning Outcomes/ Course Objectives	Eligible Other Syllabi Content		Learning Experiences Requested to Reflect Outcomes/ Objectives /Syllabi Content	Learning Experiences Not Requested	Learning Experiences Received or Description Provided	Units of Analysis
Communication Sciences and Disorders	1	2	0	0	2	0	4	4
Exercise Physiology	5	4	1	5	5	0	6	6
Interdisciplinary Health Studies	2	3	5	6	6	0	8	8
Nursing	6	21	0	19	19	2	6	6
Nutrition	6	14	0	12	12	2	7	7
Physical Therapy	12	35	0	31	31	5	19	18
Total	32	79	6	75	75	9	50	49

(PT2). In contrast, the IoR for PT7 provided handouts of content relevant to course objectives and used the chalkboard to draw diagrams explaining the material.

In CSD2, a learning experience began with questions on cultural biases to initiate a discussion of poverty and the opioid crisis. Often the keyword and or related word/phrase was followed by an example, supplemented with video (EXPH5). In NURS1, to understand cultural competence, students reviewed a Microsoft PowerPoint® presentation and watched a video of a Native American nurse talking about the generations of nurses in her family and how their legacy shaped her behaviors in healthcare delivery to Native Americans.

Reading

Reading assignments augmented traditional lecture and in-class discussions. In IHS1, intersectionality was defined and an example presented. Students then read a poem about being gay in Appalachia. To understand *stereotype*, students were asked to find examples in literary works by Appalachian authors. IHS2 students read short stories in different genres that used the keywords *culture* or *interprofessionalism* in and out of class. The stories were unrelated to healthcare but chosen to convey a sense of how different people come together to benefit an individual.

Students read journal and website articles. Students were asked to read a journal article to prepare for a CSD2 class discussion on the role of an interpreter. In NURS1, students were directed to a website document and after reading it, watched a video demonstrating communication between a nurse and a patient. In NURS6, a Microsoft PowerPoint® document presented examples of evidence-based practice but an article then reinforced the nursing application, explaining how a hospital system used evidence-based practice to improve patient outcomes. In EXPH3, Sections 103-104, students were required to read and use specific tables about body composition and exercise recommendations affiliated with standards of practice.

Role Playing

NURS6 students read about research misconduct on a website, then watched a video on the subject and acted it out. In PT3, students acted the role of managers developing a job description and an advertisement for front-office personnel. In PT8 and PT9, a student played the role of a patient and demonstrated impairments, while another student portrayed a physical therapist and demonstrated the activities to assess the impairments.

Case Studies

IoRs used written case studies to enhance learning and the application of keywords in both individual and group formats. In NUTR3, students had to analyze and prioritize nutrition recommendations. In NUTR1, students analyzed a case study of what an athlete eats in a given day

to determine nutrition sources and used a web-based program, Nutri Calc 2.0[®], to calculate the nutritional value of what they ate over three days.

Experiential Learning

In a paired activity, PT8 students learned about core strengthening by moving in certain positions and doing specific activities to promote it. They created two exercises that could be done in the position or replicated during the activity, and the second exercise built upon the first.

Group Learning

Some learning experiences required personal interaction within a group. In NUTR2, teams read and discussed a journal article and nutrition websites to identify the roles of nutrition professionals and interdisciplinary healthcare teams that include nutrition professionals. Students learned as a group in class, but individual participation was expected. Nutrition practitioners were also invited to speak; during class, students were given a form and individually wrote the answers to questions when they heard the practitioners address the question topic. In PT9, students read a relevant journal article, then convened in groups of three to complete an ergonomic assessment to adapt a home, work, or school setting to accommodate a person with spinal pathology.

Psychomotor Skill Development

In PT5, the IoR introduced a skill via a Microsoft PowerPoint[®] presentation that explained the diagnosis, its pathophysiology mechanism and the skill assessment outcome if impairments were found. The skill was then demonstrated and practiced during lab. Students learned the neck/cervical torsion test and interventions for vestibular oculomotor disorders, benign paroxysmal positional vertigo, concussion, and cervicogenic dizziness. In this format, didactic instruction preceded learning by doing.

DISCUSSION

Our study aimed to determine the explicit or implicit use of terms related to diversity, inclusion, cultural competence, and cultural humility in CHSP learning experiences. Only the term *diversity* was used, but variations of the keywords appeared, and one learning experience implied cultural knowledge, an element of cultural competence.

Research indicates that students are more open to diversity when exposed to these concepts in curricular and co-curricular activities. Their ability to use critical thinking skills and clinical reasoning may be enhanced (Hurtado et al., 2003; MacPhee, Oltjenbruns, Fritz, & Kreutzer, 1994).

Curricular content in the IHS, NURS, NUTR, and PT courses modeled best practices established in the literature to enhance students' understanding and application of the keywords and/or related words/phrases by including role playing, learning-by-doing, psychomotor skill development, and group learning. These techniques are based on experiential and social learning theories and best suited to adult learners (Knowles, 1972; 1988; Mukhalalati & Taylor, 2019). Most students in graduate-level healthcare programs already have foundational knowledge, but experiential learning requires decision-making, reflection on what was done, and social learning, with an emphasis on social interaction and a supportive environment (Knowles, 1972; Mukhalalati & Taylor, 2019). In the courses studied, these instructional methods were often paired with traditional lecture, class discussion, readings, and use of case studies.

A body of research indicates that group learning, self-reflection, and storytelling using different texts and art forms enhance student awareness of words and concepts. Furthermore, use of these strategies in an intersectional, multilayered format offers more opportunities for student learning (Carter-Black, 2007; Costello et al., 2017; Keenan, 1996; Kratzke & Bertolo, 2013; Narismulu, 2011; Olson, Bidewell, Dune, & Lessey, 2016). NURS and IHS courses used group activities, either in-person or via discussion boards, to foster self-discovery, understanding, and awareness of social contexts that affect healthcare. In NURS6, a group discussion fostered dialogue on research bias during communication between client and practitioner but not among a varied group of healthcare practitioners. The group discussion facilitated divergent views and came to the same conclusion about evidence of research bias. Self-reflection was not an explicit component.

The process of self-reflection is essential to developing cultural awareness (Campinha-Bacote, 2002) and overall learning (Freire, 1993). Students reflected on the learning experience and its relationship to interprofessionalism in healthcare. In IHS2, students read short stories and wrote cohesive strategies to meet a character's need, reflecting behaviors of inter-professionalism. The use of written journal entries and class discussion boards in IHS2 prompted critical thinking and clinical reasoning; no answer was right or wrong. These learning experiences are similar to a Kratzke and Bertolo study (2013) in which, after self-reflective writing, students met for a debriefing with co-facilitators, who guided the discussion of perceptions of gaining cultural knowledge and awareness, cultural encounters, and cross-cultural communication. In IHS2, after the lecture and required readings, students had to identify and discuss how the content related to behaviors required of, and demonstrated by, healthcare practitioners as an in-class activity. In IHS1, students picked descriptors from poems that represented intersectionality. Not only did they have to recognize an appropriate word, but investigate its meaning and defend its purpose in the context of the poem. In summary, students had to recognize a keyword and/or a related word/phrase (for example, stereotype) in the learning experience, then engage with it or apply it through role playing or experiential learning, then reflect on it, write about it, and/or discuss it with others. These methods with reflective elements serve to develop critical thinking and clinical reasoning skills.

Limitations

The study included courses held on the university's main campus and excluded courses offered at other campuses, which limited study enrollment. Furthermore, the COVID-19 pandemic during spring 2020 may have impacted participation of IoRs to submit learning experiences. Last, the study aimed to solicit learning experiences for each learning outcome, course objective, or other syllabus content; however, one learning outcome was inadvertently missed and eight learning experiences were not requested because IoRs were able to choose two learning experiences, in cases where three or more were eligible.

Implications

Assessment of learning based on instructional method will be the focus of our third study. This study informed researchers how to better design a future study denoting how IoRs can submit increasingly complex learning experiences that transition from lower level cognitive skills of remembering, understanding and application to those at higher levels of analysis, evaluation, and synthesis as illustrated by Bloom's Taxonomy (Anderson & Krathwohl, 2001). Just as curricula should effectively build a student base of knowledge and skills through scaffolding of learning, diversity, inclusion, cultural competence and cultural humility should be introduced, reinforced, and mastered in an intentional way throughout a student's academic program. An area for potential future research is an examination of the progression of introduction and practice of these concepts in learning experiences across the program curriculum.

CONCLUSIONS

Introducing diversity, inclusion, cultural competence, and cultural humility in higher education benefits the healthcare workforce and reduces health disparities and societal problems entrenched in social determinants of health (Graff, 1991). Knowledge of and experiences promoting reflection on these topics enhance tolerance in the collegiate landscape and prepare graduates to navigate different cultural spaces and serve diverse communities (Graff, 1991). This study assessed the presence of these terms in course learning experiences which were multi-dimensional and had relevant content and activities to convey concepts representative of those terms. However, very few courses explicitly used keywords or related words/phrases or developed contexts to direct students to deeper understanding or application. Future studies should examine how diversity, inclusion, cultural competence and cultural humility are introduced and reinforced throughout healthcare curricula and instruction.

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APPENDIX 1: MAPPING LEARNING EXPERIENCES TO LEARNING OUTCOMES/ COURSE OBJECTIVES AND SYLLABI CONTENT

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
CSD2 Diagnosis	1	IV-B Demonstrated knowledge of basic human communication and swallowing processes (cultural)	Part 1: Class discussion starter questions regarding <ul style="list-style-type: none"> • Cultural biases to overview the impact of poverty and opioid crisis Part 2: Written case study to review
	2	Multicultural populations	Part 1: Read a journal article Part 2: In class discussion of journal content: role of interpreter <ul style="list-style-type: none"> • Instances of cultural/linguistic diversity in practice
EXPH2 Section 101 Exercise Lecture	5	Diversity <ul style="list-style-type: none"> • of Clients: Wide range of individuals 	Microsoft PowerPoint® lecture <ul style="list-style-type: none"> • Age
EXPH3 Sections 103-104 Exercise Lab	5	Diversity <ul style="list-style-type: none"> • of Clients: Wide range of individuals 	Exercise recommendation table <ul style="list-style-type: none"> • Age
EXPH4 Fitness	Week 3: 9/10	Diversity <ul style="list-style-type: none"> • Communication skills 	Part 1: Pre-class learning style determination Part 2: Microsoft PowerPoint® lecture with in-class communication activity embedded
EXPH5 Motor Skill	7	Diversity <ul style="list-style-type: none"> • of Clients: Characteristics that distinguish high level performers 	Microsoft PowerPoint® lecture; video

(continued)

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
EXPH6 Research	3	Ethics	Microsoft PowerPoint® lecture <ul style="list-style-type: none"> • Selection of ethical issues in research • Related concepts of culture in communication: verbal feedback relative to lifestyle
IHS1 Prefatory	Week 3: 9/10 & 9/12; Week 4: 9/17	Culture	Learning experience not submitted
	Week 6: 10/1 & 10/3; Week 7:10/8	SDoH <ul style="list-style-type: none"> • Health and healthcare • Economic stability <ul style="list-style-type: none"> ▪ Views on Appalachian Poverty and Activism^c 	Watched a movie - <i>Remote Area Medical</i> - about healthcare access in Appalachia Learning experience not submitted
	Week 8: 10/17; Week 9: 10/22	Appalachian Diversity	Part 1: Microsoft PowerPoint® lecture: <ul style="list-style-type: none"> • Intersectionality defined; found in Part 2: Appalachian poem readings
	2	Stereotypes	Microsoft PowerPoint® lecture: <ul style="list-style-type: none"> • Stereotypes in Appalachian literature defined, and examples provided

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
IHS2 Inter-profession- alism	2	Diversity <ul style="list-style-type: none"> of Healthcare providers: Interprofessional practice for healthcare professionals 	Students read stories reflecting character roles of inter-professionalism in healthcare; journal entries & discussion boards; class discussion <ul style="list-style-type: none"> Cultural beliefs Cultural differences
	4	Diversity <ul style="list-style-type: none"> of Healthcare providers: Interprofessional practice for healthcare professionals 	1. Microsoft PowerPoint® lecture 2. Required in-text readings 3. In-class discussion relating 1 & 2 above 4. Lecture: in-class speakers <ul style="list-style-type: none"> Related concepts of diversity: healthcare professionals
NURS1 Introductory Reasoning	1	Diversity <ul style="list-style-type: none"> of Healthcare providers: various healthcare professionals 	Learning experience not requested
	10	Define cultural competencies	Read a website document: Cross Cultural Nursing Considerations <ul style="list-style-type: none"> Diverse populations Cultural competency Culture as section header Watch a video: Becoming a Culturally Competent Nurse
NURS2 Intermediate Reasoning	1	SDoH <ul style="list-style-type: none"> Education <ul style="list-style-type: none"> Language and literacy Health and healthcare <ul style="list-style-type: none"> Health literacy 	IoR chose not to participate in this phase
	6	Illustrate cultural variables and their impact on health literacy	IoR chose not to participate in this phase

(continued)

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
NURS3 Advanced Reasoning	2	Diversity <ul style="list-style-type: none"> of Healthcare providers: Interdisciplinary health teams 	IoR chose not to participate in this phase
	3	Apply cultural competence	IoR chose not to participate in this phase
NURS4 Clinical Care Lecture	2	Cultural practices Diversity <ul style="list-style-type: none"> of Clients: Child's/woman's health 	IoR chose not to participate in this phase
	3	Diversity <ul style="list-style-type: none"> of Clients: Women, children, and their families 	IoR chose not to participate in this phase
	4	Diversity <ul style="list-style-type: none"> of Clients: Women, children, and their families 	IoR chose not to participate in this phase
	7	Diversity <ul style="list-style-type: none"> of Clients: For women and children 	IoR chose not to participate in this phase
	8	Diversity <ul style="list-style-type: none"> of Clients: For the child or woman 	IoR chose not to participate in this phase
	9	Ethical analysis	IoR chose not to participate in this phase

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
NURS5 Clinical Care Lab	2	Cultural practices • Diversity of Clients: Child's/ woman's health	IoR chose not to participate in this phase
	3	Diversity • of Clients: Women, children, and their families	IoR chose not to participate in this phase
	4	Diversity • of Clients: Women, children, and their families	IoR chose not to participate in this phase
	7	Diversity • of Clients: For women and children	IoR chose not to participate in this phase
	8	Diversity • of Clients: For the child or woman	IoR chose not to participate in this phase
	9	Ethical analysis	IoR chose not to participate in this phase
NURS6 Research	2	Ethical issues	1. Read Collaborative Institutional Training Initiative and Office of Research Integrity information • Ethical practice 2. Role play characters from a video on research misconduct followed by class discussion • Ethical misconduct
	4	Diverse populations	1. Microsoft PowerPoint® slide that defines evidence-based practice 2. Read a journal article on how hospital system implemented evidence-based practice to improve patient outcomes • Related concepts of diversity : hospital patients
	6	Cultural competence	Learning experience not requested

(continued)

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
NUTR1 Prefatory	7	Diversity • of Clients: In the child and elder	Learning experience not requested
	9	Diversity • of Clients: Athlete	Sports nutrition written case study
	11	Diversity • of cultural norms as defined by: Personal eating habits	Dietary analysis: 3-day food diary; input information in Nutri Calc 2.0 [®] to learn how to do a food analysis
NUTR2 Professionalism	1	Diversity • of Healthcare providers: Applied nutritional professionals	Lecture: in-class speakers • Related concepts of diversity : healthcare professionals
	4	Diversity • of Healthcare providers: Roles of others whom food, nutrition and applied nutritional professionals	Interdisciplinary team collaboration 1. Reading: article 2. Reading: three professional websites and scrutinize for information • Related concepts of diversity : healthcare professionals, age, medical diagnoses

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
NUTR3 Medicinal	7	SDoH <ul style="list-style-type: none"> Economic stability <ul style="list-style-type: none"> Food based influences Community and Social Context <ul style="list-style-type: none"> Patient/client lifestyle 	Written case study with demographic and nutrition information <ul style="list-style-type: none"> Religious/cultural aspects of diet
	8	Diversity <ul style="list-style-type: none"> of Healthcare providers: <ul style="list-style-type: none"> Roles of others with whom registered dietitians and other nutrition professionals collaborate 	Learning experience not chosen by IoR
	9	Diversity <ul style="list-style-type: none"> Target population SDoH <ul style="list-style-type: none"> Education Educational session	Written case study used to determine education for COPD <ul style="list-style-type: none"> Related concepts of culture: lifestyle, health status, medical diagnosis
NUTR4 Seminar	3	Diversity <ul style="list-style-type: none"> Career search Dietetics workplace responsibilities and activities 	Learning experience not requested
NUTR5 Research	1	Ethical evidence-based practice decisions	IoR chose not to participate in this phase
	3	Diversity <ul style="list-style-type: none"> Communication 	IoR chose not to participate in this phase
	4	Cultural humility <ul style="list-style-type: none"> Advocacy 	IoR chose not to participate in this phase

(continued)

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
NUTR6 Nutriment & Disease	1	Cultural aspects of chronic disease	IoR chose not to participate in this phase
	3	Role of Culture Diversity <ul style="list-style-type: none"> • Aging SDOH <ul style="list-style-type: none"> • Health & Healthcare • Literacy • Education 	IoR chose not to participate in this phase
PT1 Prefatory	3	Diversity <ul style="list-style-type: none"> • of Healthcare providers: Interactions with co-workers and others • Age • Diagnosis: Patient conditions 	IoR chose not to participate in this phase
	7	Ethical responsibilities	IoR chose not to participate in this phase
PT2 General	3	Culturally competent patient education	1. Lecture: Microsoft PowerPoint® <ul style="list-style-type: none"> • SBAR as a communication tool 2. Lecture: Microsoft PowerPoint® working with an interpreter for individuals of the deaf community <ul style="list-style-type: none"> • Related phrase of cultural knowledge: ask client directly for clarifying information
	5	Diversity <ul style="list-style-type: none"> • Communication 	Learning experience not requested
PT3 Business	7	Diversity <ul style="list-style-type: none"> • of Healthcare providers: Identify professionals necessary to hire 	1. Develop job descriptions and advertisements for front office personnel

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
PT4 Neurology	4	SDOH <ul style="list-style-type: none"> • Education: Language & Literacy • Health and Healthcare: Health Literacy <ul style="list-style-type: none"> ▪ Patient friendly teaching 	Learning experience not applicable because it was graded activity
	9	Diversity <ul style="list-style-type: none"> • of Healthcare providers: Interventions delegated to physical therapy assistants 	1. Class discussion: inter-professionalism with physical therapy assistants
PT5 Neurology	3	Diversity <ul style="list-style-type: none"> • of Client: Patients with cervicogenic dizziness and concussion 	1. Lab activity: demonstration & practice of different interventions
	4	Diversity <ul style="list-style-type: none"> • of Client: Patients with cervicogenic dizziness and concussion 	1. Lecture: Microsoft PowerPoint® Cervicogenic Dizziness & Neck Cervical Torsion Test

(continued)

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
PT6 Health	2	Culturally relevant context	IoR chose not to participate in this phase
	3	Culturally competent communication	IoR chose not to participate in this phase
	4	Culturally competent patient/ client education	IoR chose not to participate in this phase
	5	Diversity <ul style="list-style-type: none"> • Ages • Genders • Lifestyles • Cultures 	IoR chose not to participate in this phase
	10	Diversity <ul style="list-style-type: none"> • Ages • Genders • Lifestyles • Health 	IoR chose not to participate in this phase
	11	Diversity <ul style="list-style-type: none"> • of Clients: Healthy and at-risk children and adolescents 	IoR chose not to participate in this phase
	14	Diversity <ul style="list-style-type: none"> • of healthcare providers 	IoR chose not to participate in this phase

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
PT7 Orthopedic	5	Diversity • Through the lifespan	1. Lecture with chalkboard diagrams 2. Handouts Pertaining to objective: tissue growth and development
	7	Diversity • of Client: Patient/client with abnormal bone and or soft tissue	1. Lecture with chalkboard diagrams 2. Handouts Pertaining to objective: articular cartilage
	8	Diversity • Throughout the lifespan	Learning experience not requested
PT8 Orthopedic	4	Diversity • of Client: Patient/client centered treatment	1. Lecture 2. Role play 3. Demonstration 4. Practice

(continued)

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
PT9 Orthopedic	1	Diversity <ul style="list-style-type: none"> • of Client: Patient/client presenting with spinal or TMJ symptoms 	1. Lecture 2. Role play 3. Demonstration 4. Practice
	4	Ethical plan of care	Learning experience not requested
	7	SDoH <ul style="list-style-type: none"> • Economic Stability <ul style="list-style-type: none"> ▪ Plan of care ensures best usage of patient/client's resources 	Learning experience not requested
	8	Consideration of a patient/client's social determinants of health	Learning experience not requested
	9	Diversity <ul style="list-style-type: none"> • of geographical location SDOH <ul style="list-style-type: none"> • Neighborhood and Built Environment <ul style="list-style-type: none"> ▪ Environmental conditions Analyze and adapt work, home, and recreational environments	1. Reading: journal article about furniture prescription for low back pain

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
PT10 Seminar 1	2	Diversity • of Clients: Older adult	IoR chose not to participate in this phase
	3	Diversity • of Clients: Older adult	IoR chose not to participate in this phase
	5	Diversity • of Clients: Older adult	IoR chose not to participate in this phase
	7	Diversity • of Clients: Older adult	IoR chose not to participate in this phase
	8	Diversity: • of Clients: Older adult SDoH: • Education • Educational brochure	IoR chose not to participate in this phase
PT11 Seminar 2	3	Diversity • of Clients: Typical and high-risk patients	IoR chose not to participate in this phase
	8	Diversity • of Clients: LGBTQ community	IoR chose not to participate in this phase
	11	Diversity • Communication: Perform sensitive interviewing	IoR chose not to participate in this phase

(continued)

APPENDIX 1 (continued)

Course	Learning Outcomes/ Course Objective or Other Syllabi Content Identifier	Learning Outcomes/ Course Objectives or Other Syllabi Content Keywords, Components, Variations or Related Words/Concepts	Learning Experiences and Instructional Materials and Formats
PT12 Seminar 3	5	Diversity <ul style="list-style-type: none"> • of Healthcare providers: Areas of specialty practice to generate optimal plans for examination and treatment of patients 	IoR chose not to participate in this phase
	7	Take into consideration social determinants of health Aspects of cultural competence and cultural humility	IoR chose not to participate in this phase

Note. Keywords, variations thereof, components and or related words/phrases that appear in learning outcomes/course objectives or other syllabus content and learning experiences are in boldface. CSD = Communication Sciences & Disorders; EXPH = Exercise Physiology; IHS = Interdisciplinary Health Studies; NURS = Nursing; NUTR = Nutrition; PT = Physical Therapy; ACSM = *American College of Sports Medicine Guidelines for Exercise Testing and Prescription* 8th edition; SDOH = Social Determinants of Health; IoR = Instructor of Record; TMJ = Temporomandibular Joint; LGBTQ = Lesbian, Bisexual, Gay, Transgender, Queer. Adapted from “Exploring the Inclusion of Cultural Competence, Cultural Humility and Diversity Concepts as Learning Objectives or Outcomes in Healthcare Curricula,” by J. V. Brown, K. J. Spicer, E. French, 2021, *J Best Pract Health Prof Divers*, 14(1), 63-81.

Overcoming the Legacy of Anti-Black Racism to Advance Health Equity

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INTRODUCTION

This article examines anti-Black racism as the driver of excessive mortality among Black Americans and proposes pathways to increase the percentage of Black healthcare professionals to improve healthcare access and outcomes for Black Americans.

Age-adjusted rates of alcohol- and drug-induced deaths are higher for non-Hispanic White Americans compared to non-Hispanic Black Americans; Smoking rates are similar at 15.5 percent and 14.9 percent, respectively (CDC, 2019). What, then, accounts for Black American's excessive mortality rates? Major cardiovascular events, cerebrovascular disease, diabetes, essential hypertension, colon and prostate cancer, breast cancer, homicide by firearms, and HIV— research has linked both the presentation and high mortality rates associated with these conditions to racism within and external to the medical system. Hypertension, for example, presents at rates higher in Black Americans than any other racial group. A recent study of 1,845 individuals over a ten-year period reveals that, even after accounting for other risk factors, discrimination is the determining factor (Forde et al., 2020, p. 715). The process by which racial discrimination adversely affects people's health over time is often referred to as “weathering” (Geronimus, 1992, p. 207).

WEATHERING THE LONG ONSLAUGHT

While the hypertension study focused on participants' perceptions of interpersonal discrimination, a closer look at the history of medicine in the United States reveals the ways in which broader social structures—including legal cases, educational policies, healthcare infrastructural decisions and resource allocation—have disproportionately increased mortality rates among minoritized racial groups. Further, minoritized racial groups have been subjected to direct medical violence: experimental treatments, nonconsensual operations, and refusal of care. During the period of chattel slavery, Dr. J. Marion Simms operated on unanesthetized enslaved women to develop the gynecological practices that built his medical reputation and wealth (Owens, 2017, pp. 1-3). He was not the only physician who experimented on enslaved individuals throughout the Atlantic world. In fact, White physicians propounded theories about Black people's vitality to justify enslavement. Dr. Samuel Cartwright, a Southern physician and slaveholder, developed the spirometer to "prove" that the lung capacity of Black individuals made them better suited for hard labor (Braun, 2014, p. 22). Noted biologist Dr. Luis Agassiz compiled daguerreotypes of enslaved men and women to support his theorizing around "polygenesis", or the belief that the races he identified among humans descended from different species; he deemed White, Anglo-Saxons the most advanced (Rusert, 2017, pp. 8-9). Though Black American intellectuals like Dr. Martin Delaney and Frederick Douglass argued fervently against these belief systems, Atlantic racial science permeated beliefs about African inferiority (Delaney, 1879; Douglass, 1854).

These theoretical engagements did not end with medicine but influenced policies and legal actions. In 1846, Dred Scott (1799-1858) and his wife Harriet unsuccessfully sued for their family's freedom. They argued that, though US Army surgeon Dr. John Emerson purchased Scott as an enslaved person in Missouri, Scott had lived in the free state of Illinois and the free territory of Wisconsin for four years. Therefore, residing on free soil for this extended period erased his slave status. In the 1857 Supreme Court case *Dred Scott v. John F. A. Sandford*, Chief Justice Roger Taney's decision reflects the view that enslaved individuals were not human:

They had for more than a century before been regarded as beings of an inferior order, and altogether unfit to associate with the White race, either in social or political relations; and so far inferior, that they had no rights which the White man was bound to respect; and that the [Black American] might justly and lawfully be reduced to slavery for his benefit. He was bought and sold, and treated as an ordinary article of merchandise and traffic, whenever a profit could be made by it.

In this decision, Justice Taney emphasizes the ways enslaved individuals remained chattel, or property, deeming Black Americans as "of an inferior order". His beliefs were sustained by social

attitudes even after the passage of the 13th and 14th Constitutional Amendments that essentially nullified his ruling.

In the realm of healthcare, the American Medical Association (AMA) refused to seat three Black American physicians as delegates at its annual meetings in 1870 and 1872. This exclusion continued through the mid-1960s. In 1963, out of the total 227,027 US physicians, only 5,000 were Black Americans. Although AMA membership was often a requirement for hospital privileges and specialty training, Black Americans were excluded. The AMA did not formally apologize until 2008 (Washington, 2008, para. 2).

Along similar lines, around the time of the formal dissolution of slavery, the federal government established the Freedman's Hospital in Washington, DC, which became the teaching hospital of Howard University's Medical School in 1868. However, in the early 1900s, the Carnegie Foundation commissioned education specialist Abraham Flexner to evaluate medical schools in the United States. His 1910 report led to a mass shutdown of medical schools by 1923, including 5 of the 7 medical schools that trained Black students. Howard University's Medical School and Meharry Medical College survived the shutdowns because, as Flexner wrote, "ten million of them [Black Americans] live in close contact with sixty million Whites. Not only does the [Black American] himself suffer from hookworm and tuberculosis; he communicates them to his White neighbors ... The [Black American] must be educated not only for his sake, but for ours" (Flexner, 1910, p. 180). Flexner's attitudes about disease, contamination, and segregated training facilities reflect broad social and legal trends of the times, including the Jim Crow laws in the South that mandated racially segregated medical treatment. Note that despite efforts to disenfranchise Black communities, W. E. B. Du Bois convened a major conference at Atlanta University and in 1906 produced *The Health and Physique of the [Black] American*, an extensive volume of scholarship that attributed health disparities to racial barriers (Nelson, 2011, p. 45). Similarly, Booker T. Washington established National [Black] Health Week in 1915, an activist platform that grew over the coming decades (Nelson, 2011, p. 28).

Du Bois and Washington represent only two of the activists engaged in the burgeoning Medical Civil Rights Movement. In 1883, Dr. Rebecca Lee Crumpler published *A Book of Medical Discourses*, which educated Black parents on infant and childcare. Black nurses banded together in the early 1900s to form their own association after being disenfranchised from White groups. Both the National Medical Association, formed in 1895, and the National Association for the Advancement of Colored People, formed in 1909, fought for health equity. The work of Dr. Montague Cobb, among others, eventually saw the removal of the separate-but-equal clause of the Hill-Burton Act, the development of Medicare, and, in 1964, the desegregation of hospitals (Nelson, 2011, p. 39).

INVESTING IN BLACK AMERICAN-SERVING INSTITUTIONS

While these activists, along with numerous other individuals and groups, fought for health and educational equity in the United States, research reveals the continuing need to grapple with the “slave health deficit”, or the inequitable health outcomes among racial groups that grew out of enslavement and persist today (Byrd et al., 2001, p. 93). Similarly, the number of Black physicians in the United States has hardly grown. In 1910, Black American physicians comprised about 2.5 percent of the workforce; as of 2020, the percentage is about 5.3 percent, even though Black Americans comprise 13 percent of the population (AAMC, 2021). Robust and strategic investment in Black-serving institutions and declaring racism a public health crisis to inform policy and budgetary priorities are critical steps in closing the health disparities gap.

On December 19, 2019, with bipartisan support, the FUTURE Act was signed into law by then-President Donald J. Trump. It restored \$255 million in funding that had lapsed in September 2019 because of Congress’s failure to renew it. The FUTURE Act permanently guarantees \$255 million in annual STEM funding for minority-serving institutions, with HBCUs receiving around \$85 million annually (H.R. 2486). However, it comes after inflation-adjusted declines in science and engineering funding allocated to HBCUs by federal agencies compared to 2009 (Pece, 2021, p. 1). Coupled with the funding challenges of COVID-19, this decline threatens the ability of HBCUs and other minority-serving institutions (MSIs) to support the training of medical professionals and health-equity research. In 2021, the Biden administration proposed the American Families Plan, which offers two years of tuition to students attending HBCUs, Tribal Colleges and Universities (TCU), and MSIs. Bipartisan congressional support will be needed to enact this important legislation.

Evidence reveals that the presence of Black physicians and healthcare workers positively affects the health of Black Americans. A longitudinal study published in 2020 found that when Black physicians care for Black infants, their mortality penalty compared to White infants’ is halved (Greenwood, 2020, para. 10). A 2018 study found that having a Black physician closed the Black/White gap in men’s cardiovascular mortality by 19 percent (Alson, 2019, p. 4071). These statistics clearly point to the need for increased training opportunities for Black medical professionals, yet Dr. Valerie Montgomery Rice notes that the number of Black students entering medical school has stagnated at 7.4 percent over the past 15 years. She also notes a 32 percent decrease in the number of HBCU graduates who enrolled in medical school from 2004 to 2018 (Rice, 2021, p. 23). She argues that supporting HBCU students could lead to the medical school enrollment of over 2,500 more Black students annually.

Anti-Black racism and low percentages of Black healthcare professionals inhibit access to care and sustain disparate health outcomes for Black Americans. Solutions must account for the history of systematic exclusion in the United States. For instance, given the benefit of HBCU education for Black STEM and medical students, increased cross-sector (government, business,

philanthropic) funding should be mandated. We argue for channeling these funds into a range of supportive, research-based practices, such as creating visiting faculty lines (Campbell et al., 2020), increasing mentorship, opportunities, and equity for Black women and men in STEM (Lee, et al., 2021), rectifying post-COVID-19 funding deficits, supporting STEM students with MCAT training (Capers et al., 2015, p. 41), and developing preK-12 health professions pathway programs (COGME, 2016; HRSA, 2009; Laurencin, 2020; Wrensford, et al., 2019).

We advocate for the deliberate allocation of these funds to serve manifold purposes. First, on a strategic level, it will prompt the training of Black healthcare providers, which research has proven supports positive health outcomes for Black patients and communities and can increase health equity. Second, on a symbolic level, this funding refutes the narrative of health as based solely on individual choices and addresses the systemic inequities that shape lethal disparities. In the wake of the COVID-19 pandemic, which only widened gaps in racially-biased health outcomes, HBCU capacities must be bolstered to produce students prepared to enter the health professions. Supporting the premedical and prehealth program training of HBCU students offers a means to mitigate the health gap driven wider by the COVID-19 pandemic and to rectify the systemic injustices that account for health disparities. Sociologist Alondra Nelson writes that “health is politics by other means” (Nelson, 2015, p. 1). Bolstering HBCUs’ capacity to train future health professionals centers political priorities on health equity, access, and justice.

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A Policy Brief: The Removal of ‘X-Waivers’ to Promote Access to Buprenorphine for Opioid-Use Disorder

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OVERVIEW

Medications for opioid-use disorder (MOUDs) prevent relapse and save lives. The Food and Drug Administration (FDA) has approved buprenorphine (BUP), but despite robust evidence of its effectiveness and safety, access is limited by federal policies requiring providers to have a US Drug Enforcement Agency (DEA) X-waiver to prescribe. Fewer than one in 10 providers are waived. This brief highlights the barriers to prescribing BUP associated with X-waiver requirements and emerging policy opportunities that address these challenges

Takeaways:

1. Opioid-use disorder remains an alarming public health crisis, expanding from rural areas to cities and from mostly white communities to communities of color.
2. Buprenorphine is an effective, FDA-approved medication to treat OUD, but providers must be “waivered” in order to prescribe it.

3. Obtaining a waiver is a complex process, resulting in a shortage of waived providers and a wide treatment gap.
4. The Mainstreaming Addiction Treatment Act (H.R.2482) is a bipartisan bill that will remove X-waiver requirements for physicians.
5. Passing this bill will save lives by advancing treatment and recovery support for individuals suffering from OUD.

WHAT IS OUD?

Opioid-use disorder (OUD) is a treatable chronic disease. Opioids attach to and activate receptors in the brain, altering its structure and function and the body's hormonal balance, perception of pain, and homeostasis (Strang et al., 2020). Repeated opioid use creates physiological imbalances that are difficult to reverse and lead to physical dependence and withdrawal symptoms. Addiction is a primary reason why OUD is a chronic relapsing disease; physical dependence and uncontrollable drug use persist, despite adverse consequences (NIDA, 2019; Strang et al., 2020).

WHAT ARE MOUDS?

A common, effective treatment approach relies on medications for opioid-use disorder (MOUDs) in conjunction with counseling and other types of support. (Wakeman et al., 2020). The US Food and Drug Administration (FDA) has approved three MOUDs: *methadone*, *naltrexone*, and *buprenorphine* (BUP) (Maglione et al., 2018). They prevent opioids from binding with receptors (Fig. 1). Full agonists, such as methadone, fully attach to and activate opioid receptors. Partial agonists, such as BUP, attach to but only partially activate receptors. Naltrexone is an opioid antagonist, which blocks opioid receptors (Hoffman, Terashima, & McCarty, 2019). These medications assist in drug detoxification and prevent withdrawal; they also eliminate opioid cravings (Blanco & Volkow, 2019). Despite evidence supporting their effectiveness, their rate of use is low (Hoffman et al., 2019), especially in rural areas (Havens et al., 2018).

OUD AND MOUD IN BLACKS/AFRICAN AMERICANS

Opioid-use disorder and overdose deaths disproportionately affect Blacks/African Americans compared to other races/ethnicities. Among other enduring health disparities, their access to treatment for substance-use disorders is disproportionately poor (Howard, 2019). Specifically,

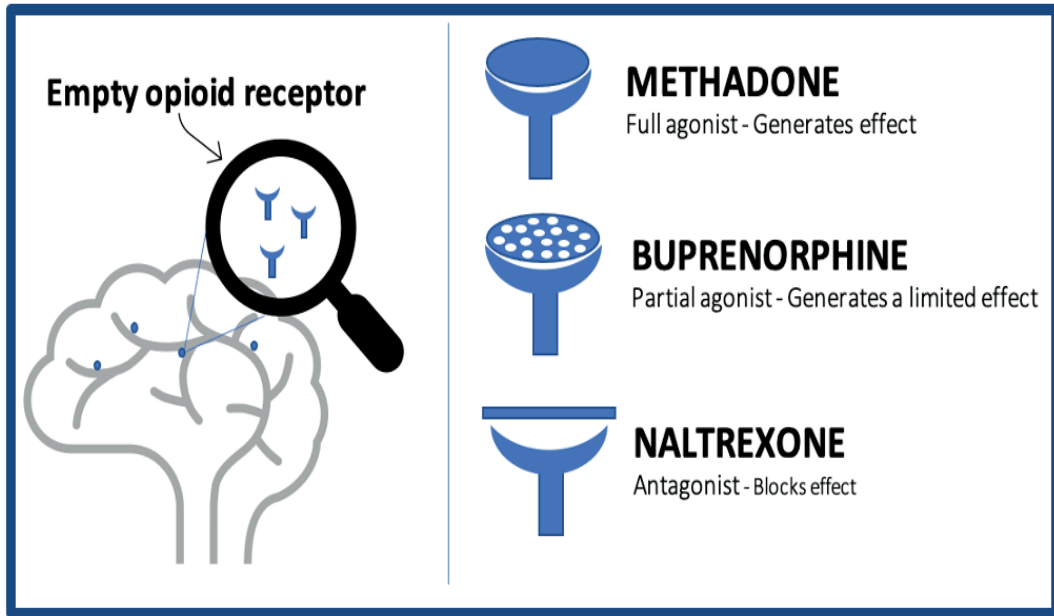


Figure 1: Medications for opioid-use disorder (MOUDs): How they work in the brain

initiation of, and retention in, MOUD treatment is significantly lower among Blacks than non-Hispanic Whites (Chandler et al., 2020). Barriers include systemic racism, lack of insurance and transportation, and mistrust of MOUDs, especially methadone (Stevens-Watkins, 2020). While buprenorphine is an effective alternative, minority communities' access to it is limited.

BUPRENORPHINE

The FDA approved BUP in 2002 as the first opioid agonist that could be routinely prescribed in physicians' offices; methadone can only be prescribed and dispensed at treatment programs certified by the Substance Abuse and Mental Health Services Administration (SAMHSA) (Chandler et al., 2020). Evidence shows that, prescribed in this way, BUP is as effective as methadone, with less potential for abuse and overdose (SAMHSA, 2021). However, provider and policy barriers limit access for Blacks and other communities of color (Haffajee, Bohnert, & Lagisetty, 2018).

Quick Facts: Buprenorphine

1. Waivered providers can prescribe BUP to patients in their offices, so doses can be taken at home like most other medications.
2. BUP has low abuse potential.
3. Treatment with BUP, compared to methadone, is potentially more accessible, cost effective, and safe and equally efficacious.
4. Patients who take buprenorphine feel normal, not high. Because the brain thinks it is receiving the problem opioid, patients do not experience withdrawal symptoms, and cravings are reduced.

CHALLENGES TO TREATMENT

Legal regulations and limitations

The Drug Addiction Treatment Act of 2000 permitted only qualified physicians who obtained an “X-waiver” to prescribe BUP. In 2016, prescription authority was expanded to include nurse practitioners (NPs) and physician assistants (PAs) (Roehler, Guy Jr., & Jones, 2020). Despite this expansion, the pool of practitioners who can prescribe BUP remains narrow, in part, due to the X-waiver requirements (Fiscella, Wakeman, & Beletsky, 2019): 8 hours of training for physicians; 24 hours for NPs and PAs.

Prescription limits/patient capacity

Due to federal regulations, providers are not allowed to treat more than 30, 100, or 275 patients with BUP, depending on how many years they have been waived (McCarty, Priest, & Korthuis, 2018). This prescription restriction makes the waiver system a barrier to care for the large number of OUD patients in need.

Underutilized providers

Further, although the need for OUD treatment continues to exceed the number of waived providers, many of these providers are treating fewer patients with BUP than their limit permits. Millions of patients are left with no access to BUP, despite availability (Duncan et al., 2020).

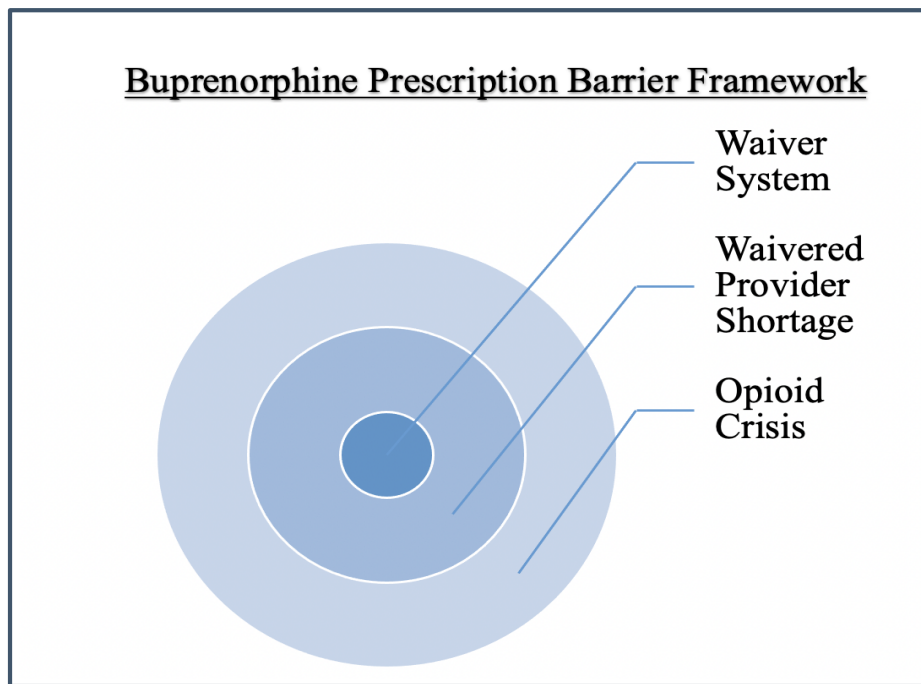


Figure 2: Buprenorphine Prescription Barrier Framework

FRAMEWORK BARRING BUPRENORPHINE PRESCRIPTION

Figure 2 depicts a three-layer model explaining the factors contributing to the BUP prescription dilemma. **The outer layer** represents the rise in opioid use to the crisis level. Annual treatment of OUD with BUP approximately doubled from 2009 to 2018 (Olfson et al., 2020). However, rates still trail national estimates of prescription opioid disorder and heroin use (Olfson et al., 2020).

The middle layer represents the shortage of waived providers. Recent estimates indicate that among over a million active physicians, 248,000 NPs, and 115,000 Pas nationally, only 5 percent are waived (Berk, 2019). The gap between qualified providers and those with waivers is clearly significant. To worsen the problem, research shows that among waived providers, only 50.9 percent are active (Fig. 3) (Duncan et al., 2020). Thus, only half of qualified providers are actively treating OUD patients, a level inadequate to mitigate the opioid crisis.

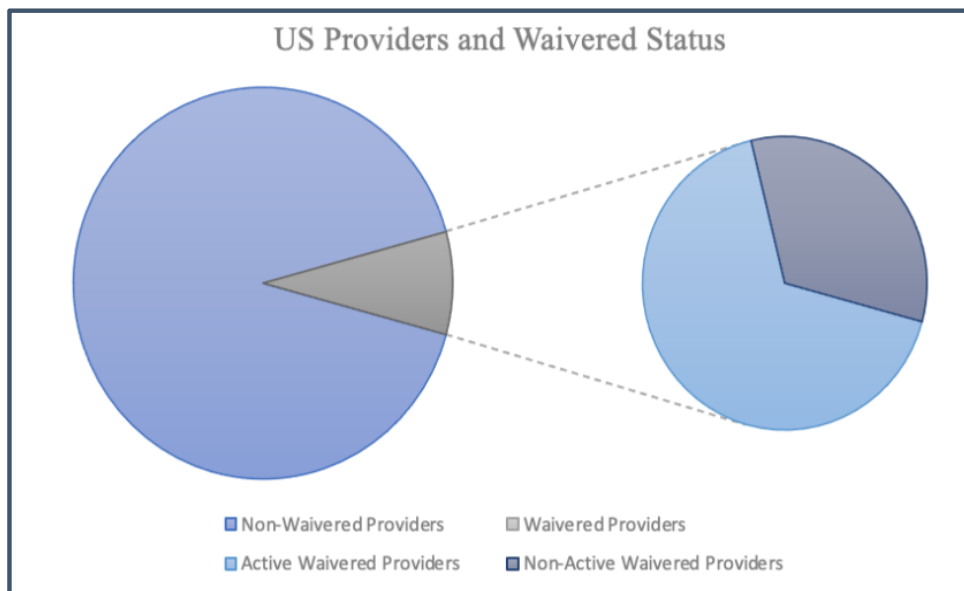


Figure 3: United States Providers and Waivered Status

The core layer represents the systemic limitations inherent in waiver-process requirements for BUP prescription. It is complex and contributes to provider shortage due to:

1. stressors associated with time and other application requirements, particularly for already overworked providers; and
2. patient-treatment caps contingent on the number of years waived and additional application requirements to decrease limits.

STRATEGIES TO PROMOTE ACCESS – POLICY OPPORTUNITIES

The Mainstreaming Addiction Treatment Act (H.R.2482) is a bipartisan bill that eliminates the physician-waiver process for prescription of BUP and all Schedule II, IV, and V narcotics under the Controlled Substances Act. It aims to enhance access to life-saving treatment by eliminating unhelpful bureaucratic obstacles. Further, the bill requires the Secretary of Health and Human

Services (HHS) to institute a national education campaign to inform clinicians about the modified BUP prescription requirements and encourage all eligible providers to treat OUD.

H.R. 2482 directly addresses the barriers outlined above:

Outer Layer: Societal

- a. Expanding physicians' BUP prescription capacity directly addresses the social stigma associated with OUD. This legislation at the federal policy level normalizes and improves access to OUD treatment by allowing its provision in healthcare settings.
- b. Fusing behavioral health and primary care across society establishes administrative concordance for providers and payers and decreases logistical challenges for patients in the healthcare system.

Middle Layer: Providers

- a. Permitting all licensed physicians to prescribe BUP to a maximum of 30 patients increases the provider pool.
- b. Increasing the pool widens care to a variety of healthcare settings—clinics, emergency departments, hospitals—across urban and rural areas in all communities.
- c. Requiring the launch of a national education campaign ensures physicians are more informed about how to effectively treat OUD with BUP.

Core Layer: System

- a. Removing the waiver requirement for physicians expands access to BUP to attenuate the OUP crisis.

Conclusion and Future Considerations

As the opioid crisis worsens across all communities, more providers are needed to meet the demand for OUD treatment, particularly in communities of color. We encourage Congress to enact H.R. 2482 to strengthen the nation's response to the opioid crisis. It will remove the X-waiver requirement for physicians, increasing the number able to prescribe BUP. Though passing this bill will be a step forward, removing the X-waiver requirement for NPs and PAs as well would further close the treatment gap. Nevertheless, H.R. 2482 will advance ongoing efforts to address the opioid crisis at the societal, provider, and core levels.

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**For questions related to faculty positions, please contact
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Associate Dean of Nursing, at cunninghamt@wssu.edu or 336-750-2659.**

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ISSN 2475-2843

ISBN 978-1-4696-7728-6



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