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Training Implicit Bias and Awareness of the Impact of Systemic Racism on Health: a Preliminary Study of Second-Year Optometry Students

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Abstract

Background: *Heretofore, the impact of formal diversity, equity and inclusion training have not been evaluated in optometric education. Poor health outcomes have been linked to inequities centered on race and socioeconomic status.* ***Methods:*** *Coursework was developed to integrate diversity, equity and inclusion principles in two courses. Activities for the courses focused on communication skills, empathy and implicit bias awareness to improve optometry students' ability to connect with diverse patients and ultimately improve health outcomes. Learner perspectives were assessed before, during and after the coursework was presented.* ***Results:*** *Learners demonstrated statistically significant improvement in understanding the impact of race on health outcomes and increased confidence in discussing race with peers (p=0.003 using paired two-tailed t-test). Learner confidence in providing fair and equitable care was initially statistically significant in each category of race, sexuality, gender and religion (responses evaluated using the Wilcoxon signed rank test). However, in assessing confidence 6 months after the course ended, there was a noted decrease in confidence, which was not statistically significant.* ***Conclusion:*** *The results of this implementation are promising, yet the effects appear to be transitory. These results reinforce the need for further attention and development in this area.*

Key Words: *public health; empathy; implicit bias; diversity, equity and inclusion; interprofessional education; optometric education; health disparity; health equity*

Introduction

In 2003, an Institute of Medicine report found that racial and ethnic health disparities are associated with worse health outcomes. The report also noted that provider bias, stereotyping, prejudice and clinical uncertainty may contribute to racial and ethnic disparities in health care. Thus, it was recommended that future health professionals be educated in cross-cultural education.[1] In 2008, the Association of Schools and Colleges of Optometry released "Guidelines for Culturally Competent Eye and Vision Care" to assist educators with training of students in the delivery of such care to patients.[2]

Racial and ethnic health disparities have increased despite health professions community efforts to counter their effects.[3] A 19-year serial analysis of National Health Interview Survey data, which included 596,355 adults, showed that although access to health care has improved across all racial groups, racial health disparities remain.[4] Furthermore, the COVID-19 pandemic illuminated glaring health disparities in which marginalized populations were affected more severely and had higher morbidity rates compared to

White counterparts.[5-7] These facts underline the extent of the gaps in the healthcare system for minority populations.[8-9] In 2021, Mendez, et. al stated that racism has been cited as a key driver of racial health inequities.[10] Dr. Camara Jones, Past President of the American Public Health Association (APHA), defines racism as “a system of structuring opportunity and assigning value based on the social interpretation of race, that unfairly disadvantages some individuals and communities, unfairly advantages other individuals and communities, and saps the strength of the whole society through the waste of human resources.”[11] Furthermore, Mendez et al. noted that racism has three components: institutionalized, interpersonal and personally mediated, and internalized, concluding that structural racism is the sum of which racism operates in a society.[10-11] Additionally, in 2020, the APHA, declared structural racism a public health crisis.[1,10,13-16] This position was highlighted with the parallel events of the COVID-19 pandemic and attacks on civility, inciting racial unrest including marches and riots in support of the Black Lives Matter movement.

Integrating training to address the underlying cause for health disparities into a health professions curriculum is not an easy feat. The benefits thereof have the potential to be profound in the care of patients. Unpacking the remarkable source of health disparities that the APHA has identified as racism, not only gives one pause, but also warrants awareness and reflection. With this in mind, public health curriculum instructors at Southern College of Optometry (SCO) collaborated with the Coordinator of Student Diversity and Inclusion prior to the 2020 summer semester to determine impactful methods to acknowledge the current social unrest and the role that healthcare practitioners have in reducing health disparities. Several options were considered, such as reasons for and effects of medical mistrust, implicit bias in health care, and the intersection of optometry and social justice. By embracing racism as an etiology of reduced patient outcomes and understanding contributing factors of health disparities with our patient population, the approach we embarked upon was to highlight empathy, implicit bias and communication in two of our courses: Interprofessional Education (IPE) Series and Clinical Communication & Patient Care. We hypothesized that after student exposure to this curriculum, students’ overall understanding of racial bias and the direct influence on health outcomes would improve.

Southern College of Optometry and the Memphis Community

SCO is located in Memphis, which is the second largest city in Tennessee with approximately 650,000 residents. Memphis is the county seat for Shelby County, which has a population of approximately 930,000. Memphis has a significant minority population with African Americans constituting approximately 64% of the population.[17-18] According to Julian, income is highly correlated to health disparities in Tennessee.[19] The city of Memphis has a longstanding struggle with poverty. In 2019 Memphis ranked fifth in overall poverty rate and second in child poverty rate out of 36 cities in the United States with a population greater than 500,000. This statistic was noted in the University of Memphis Poverty Fact Sheet for 2020 along with the following poverty rate data for 2019: city of Memphis 21.7% overall poverty rate compared to 12.3% nationally, 13.9% in the state of Tennessee, and 16.8% for Shelby County. Child poverty rates were stated as 35.0% for Memphis, 16.8% nationally, 19.7% for the state, and 25.9% for the county.[20] Life expectancy (LE) is a notable health disparity in Shelby County. In 2018, using 2015-2016 census and death rate data, Lilian (Ogari) Nyindodo investigated the impact of economic conditions on health outcomes within Shelby County using LE as the key metric. Initially, Dr. Nyindodo saw a 9.1-year gap in LE between Black (75.4 years) and White (84.5 years) constituents of Shelby County (Nyindodo L. Life expectancy and economic hardship index per ZIP code in Shelby County. Virtual presentation at Southern College of Optometry; 2020; Memphis). In 2015, the difference in life expectancy between the Black and White populations in the United States was 3.4 years.[21] Using Shelby County data through 2016, Dr Nyindodo investigated this discrepancy between national and Shelby County averages and identified a 14-year spread in LE within the county. She further refined the data to ZIP-code level and correlated LE to the Economic Hardship Index (EHI). EHI includes six social determinants: unemployment, dependency, education, income level, crowded housing and poverty. She

demonstrated an inverse relationship between EHI and LE: The ZIP code (38106 + 38126) with the highest EHI (98) had the lowest life expectancy (69), and the ZIP code (38017) with the lowest EHI (16) had the highest life expectancy (83) (Nyindodo L. Life expectancy and economic hardship index per ZIP code in Shelby County. Virtual presentation at Southern College of Optometry; 2020; Memphis).

Table 1. Click to enlarge

Our clinic, SCO's The Eye Center (TEC), is located in the Medical District on the edge of downtown and midtown. More than 62% of the patient population are persons of color. An analysis by ZIP code was run to examine the patient population in more depth (TEC database query results provided by Mark Irving, Compulink Database Manager). The poverty levels in two of the four major TEC patient population ZIP codes provide more context to risk factors affecting our patient population **(Table 1)**. The ZIP code that ranks second in highest levels of poverty in the city at 43% is also the ZIP code where the clinic receives the second highest number of patients. Interestingly, the ZIP code with the fourth highest poverty level, 42%, is also fourth in patient numbers for our clinic. We note anecdotally that many of our patients have significant ocular and systemic health issues.

In contrast to the demographics of Memphis and TEC patient populations, 23% of SCO students are considered minorities, with less than 4% identifying as Black or African American.[18] As the patient population and student population are not racially concordant, other approaches to improve health outcomes must be incorporated.

Methods

The SCO curriculum currently includes seven courses for a total of nine credit hours that highlight concepts in public health. The courses span first-year spring through third-year spring.[22] These course offerings address concepts of cultural competence and working with and within the social and professional healthcare community, thus providing a continual unifying theme throughout the curriculum. Communicating with individuals who may not share your perspective and background is a skill addressed in Foundations of Service Learning, IPE Series and Clinical Communication & Patient Care.

A sudden shift to remote learning due to the 2020 pandemic offered an opportunity to introduce significant changes to course delivery for several courses. In-person events such as onsite observations of other health professions working with patients/clients and vision screenings in the local school systems were cancelled leaving openings to develop new projects. In consultation with our Coordinator of Student Diversity and Inclusion, new activities were created for two courses. The IPE Series (OPT204) activities were designed to raise awareness of implicit bias and its impact on patient care. The Clinical Communication & Patient Care (CLN216) course activities were designed to highlight the impact of systemic racism on health and health disparity. The intent in highlighting implicit bias in the first course and systemic racism's impact on health in the second course was to allow students to connect to how they are personally impacted by the structures that create systemic racism and to understand that they play a role in helping or hindering their future patients' path to health. 134 students were enrolled in the selected courses. Their perspectives were assessed before, during and after the coursework. Responding to the assessment surveys was tied to participation grades for the courses; however, participants could elect to have their responses removed from analysis if there were any potential risk to anonymity of the data.

Quantitative analysis involved paired t-test for data with a normal distribution and Wilcoxon signed-rank test for data without a normal distribution. The CLN216 pre- and post-course questionnaire was evaluated with paired t-test method. The comparison of different survey results for OPT204 used Wilcoxon signed-rank test. Qualitative analysis was performed on data collected in the reflection

assignments. To complete the qualitative analysis, an initial review of the data sets was conducted to establish initial themes. Codes were created and the data was reviewed to assign codes to each response. Themes and codes were refined with further review of the data and with comparison of the results for each data set. A final review of the data was completed to assign each response a code and to count the number of responses assigned to each code.

Additional details of methodology specific to each course are described below.

Course 1 OPT204 Interprofessional Education Series

A significant portion of the IPE Series course focused on investigating personal biases and reflecting on how that could impact caring for patients. The activities assigned are listed in **Table 2**, items 1-7. Online resources used for these activities were the Harvard-based Implicit Association Test (IAT) website[23] and The Ohio State University Kirwan Institute Implicit Bias Module Training.[24] Survey participation was tied to the grade for the assignment; however, respondents were asked at each survey point if they authorized use of their responses in presentation of the results. If a respondent answered no at any of the three collection points during the course, their responses for all surveys were excluded from analysis. Some respondents did not complete all three surveys; if they did not ask to be excluded from analysis, their responses were compared where available. Some duplicate responses were also excluded from analysis. We developed the survey instrument for this study to assess the impact of class assignments on student perceptions.

Table 2. Click to enlarge

Survey 1 asked about previous exposure to IPE, implicit bias and implicit association as well as self-reported demographics. Survey 2 asked about IAT topic, comfort with and skepticism of IAT results. Survey 3 asked about changes in awareness of bias and self-reflection. The following question was posed on each of the three surveys: How concerned are you with your ability to provide fair and equitable care to your patients based on any of their identifying features? The four identifying features were race, gender/gender presentation, sexuality and religion. Response options were Not at All (1), Minimally (2), Moderately (3) and Very (4). A fourth survey was administered after the course was completed to assess carryover of the impact of the course and included the question noted above. Survey 4 completion was voluntary, which resulted in fewer responses. All surveys are summarized in **Appendix A**.

With Survey 2, IAT options were categorized into three broad topics. Students were asked to select one topic area for which they felt they were biased and one topic area for which they felt unbiased. For the implicit bias training modules, students were asked to complete the entire training module with check-ins (self-assessment for training modules) for the introduction, module 1, module 3 and module 4. For module 2, they were asked to complete lesson 4 only as this module involves taking an IAT, which students had already done. The small-group reflections addressed overcoming biases held by self and biases encountered in others.

Course 2 CLN216 Clinical Communication & Patient Care

While the IPE Series focused on the identification and self-awareness of implicit bias, the second course, CLN216 Clinical Communication & Patient Care, sought to deepen the students' understanding of the environment in which racial healthcare disparities exist, as well as the disproportionate effect of race on clinical health outcomes. Additionally, the course sought to assess student comfort level in engaging in discussions regarding race with patients and other healthcare professionals.

For this intervention, 134 second-year optometry students were asked to complete a voluntary and anonymous pre-assessment questionnaire, then view two recorded modules: one on cultural competence and the other on the impact of race and health outcome. Following completion of the recorded modules, the same voluntary and anonymous questionnaire was administered as a post-assessment survey. Finally, at the conclusion of the entire assessment, students were asked to provide a 250-word self-reflective essay. The first module, “Cultural Competence & Health Literacy” (a recorded lecture provided by SCO Associate Professor Wil McGriff, OD, MPH) discussed how patients’ understanding of their own health, willingness to accept treatment recommendations, and varying treatment outcomes are associated with the cultural context in which the information is provided. The second module was adapted from the American Public Health Association’s (APHA), “Naming and Addressing Racism: a Primer.”[25] This module explained how racism impacts public health and how race is associated with varying health outcomes.

Data were collected via a 10-question survey; participation was anonymous and voluntary. The survey measured students’ comfort and knowledge of race and racism and specifically their understanding of how race affects health. Because a validated survey to measure our desired outcomes could not be identified in the literature, we chose to adapt a previously developed survey instrument by Bright, et al.,[26] which posed similar questions to a medical student population.

After completing the post-assessment questionnaire, learners completed a post-activity reflection assignment. Participation in this reflection assignment was mandatory and tied to the course grade. The assignment required the learner to write a 250-word essay that answered: “What did you learn that surprised you?” and “How will this knowledge impact how you will interact with patients?” This exercise encouraged learners to think about what strategies they may invoke as future clinicians to address the information they had learned through completing this module.

Results

Course 1 OPT204 Interprofessional Education Series

Figure 1. On a scale of 1 (no concern) to 4 (very concerned), responses to the question “How concerned are you with your ability to provide fair and equitable care to your patients based on any of their identifying features?” Click to enlarge

The following question was asked on each of the four surveys: “How concerned are you with your ability to provide fair and equitable care to your patients based on any of their identifying features?” The level of concern was analyzed for each of the following identities: race, gender/gender expression, sexuality and religion. Survey 1 was before the implicit bias test; Survey 2 was administered after the implicit bias tests; Survey 3 was administered at the end of the course; and Survey 4 was administered the following spring semester, more than 3 months after completion of the course. A graphical representation of responses can be found in **Figure 1**. Wilcoxon signed-rank test was used to analyze the change in survey responses at each data point. There was a statistically significant reduction in concern about providing fair and equitable care to patients from Survey 1 to Survey 2 in each identifier category except sexuality. The only statistically significant reduction in concern for the category of sexuality was from Survey 1 to Survey 3. Concurrently, this decline in concern from Survey 1 to Survey 3 was noted for identifiers gender/gender expression and religion. Comparing the level of concern responses for race, the change from Survey 1 to Survey 3 was not statistically significant; however, there was a statistically significant decrease in concern from Survey 2 to Survey 3. Survey 4 was administered in the spring of 2021, approximately 6 months from the end of the course. The level of concern to provide fair and equitable treatment increased in all four categories; however, none of the comparisons with Survey 4

results was statistically significant. Statistically significant changes with p-value information are listed in **Table 3**.

Survey 1 (after exclusions, n=119) revealed the students' experience with IATs. Survey 2 (after exclusions, n=119) examined which categories the students selected and how they felt about the results. With respect to identifying as a minority, 26% of participants identified as a minority race, 9% identified as a minority gender or gender presentation, 2% identified as a minority sexuality, and 16% identified as a minority religion. Prior to this course, 80% of respondents had some exposure to implicit bias training, and 16% had taken an IAT. Appendix A provides details about the surveys. For the first IAT, students chose a topic on which they felt unbiased: 45 chose a race topic, 42 chose a gender/sexuality topic, and 31 chose other topics. For the second IAT, students chose a topic for which they had a bias: 38 chose a race topic, 33 chose a gender/sexuality topic, and 47 chose other topics. Students were asked following completion of the IAT about their level of comfort with and skepticism of the IAT results for each test they chose. With respect to comfort with their IAT results, 86 were moderately to very, 23 were minimally, and 10 were not comfortable at all with results of the test selected for which they felt unbiased. For the second IAT (for which they felt a bias) 90 were moderately to very, 19 were minimally, and 10 were not comfortable at all. With respect to skepticism of their IAT results, 78 were not at all or minimally, 29 were moderately, and 12 were very skeptical of results of the test selected for which they felt unbiased. For the second IAT (for which they felt a bias) 83 were not at all or minimally, 27 were moderately, and 9 were very skeptical. No detailed statistical analysis was performed on this data.

Table 3. Click to enlarge

Table 4. Click to enlarge

Survey 3 (after exclusions, n=102) emphasized feelings regarding awareness of the bias and the likelihood for self-reflection and inquired about recommendations to improve awareness of issues that impact patients and how optometric care is provided. Sample responses to the individual reflection question, "What would you recommend to improve you and your classmates' awareness of issues which impact our patients and how we provide optometric care?" are included in **Table 4**. Major themes of the responses were applying cultural competence concepts, practicing empathy, proactively gaining exposure to others who may be different, self-awareness, sharing personal stories, and acts of service/volunteering.

Survey 4 (n=46) was administered in the spring of 2021, at least 6 months from the end of the course to determine whether confidence about administering fair and equitable treatment of patients had been maintained from the end of the IPE course. Level of concern for providing fair and equitable treatment increased in all four categories. As described previously, this increase was not statistically significant.

For the small-group reflection, students were asked to meet virtually in pre-determined groups of approximately five. Each group was asked to reflect on the following questions.

- How can you interact with individuals in a way that "interrupt(s) the biases" people may carry with them? **(Table 5)**
- How can you interact with individuals in a way that "interrupt(s) the biases" you may have? **(Table 6)**.

Tables 5 and 6 show themes identified along with representative comments among the responses. Common themes were awareness, communication, education, cultural competence training, and professionalism.

After addressing bias, in the next semester, Clinical Communication & Patient Care examined the personal role that students can play to improve health outcomes.

Table 5. Click to enlarge

Table 6. Click to enlarge

Table 7. Click to enlarge

Table 8. Click to enlarge

Course 2 CLN216 Clinical Communication & Patient Care

Pre-discussion questionnaire and post-discussion questionnaire data were analyzed using a paired two-tailed t-test. The results showed an overall statistically significant change in attitudes, with the most statistically significant changes in belief that discussions on race have a place in optometric education, understanding how race impacts health outcomes, talking about race with patients, discussing race with other healthcare professionals, and the belief that optometry school should provide a forum to discuss race. **Table 7** provides full survey analysis and p-values. Comparative analysis of pre- and post-discussion on cultural competence, health literacy and racial bias in health care showed significant overall agreement that this activity was a worthwhile addition to the optometric curriculum with the greatest agreement and significance in understanding how race impacts medical care and health outcomes.

The results of the qualitative analysis on the reflection essays are summarized in **Table 8**. Upon review, the themes identified fell into three categories: awareness, understanding and behavioral modification. The categories of awareness and understanding were broken down into subcategories for the question “What did you learn that surprised you?” The themes identified under the category of “awareness” were cultural differences, racism, implicit bias and prejudice. The themes identified under the category of “understanding” were health disparities, health literacy and health outcomes related to race. The final question was “Will this knowledge impact how you will interact with patients?” The themes identified were modification of patient interaction, language and communication delivery.

Discussion

In examining the IPE Series course, we concluded that implicit bias awareness has the potential to increase learners' confidence in providing fair and equitable care for patients with identifiers in race, gender/gender expression and religion. Also, to achieve a statistically significant reduction in concern (increase in confidence) for the category of sexuality, other activities such as the IAT modules and group reflection were beneficial. With race, the decrease in concern, or increased confidence, for providing fair and equitable treatment was salient with awareness of implicit bias, but after more student-centered activities, there was an even more pronounced reduction in level of concern from understanding their bias to the completion of the course. To assess whether time affected the level of concern, Survey 4 was administered 6 months after the end of the course. Interestingly, when assessing this same question in Survey 4, confidence decreased in all four categories instead of maintaining or increasing, implying that although the effects of implicit bias awareness and training had an impact, the effect was transient. The number of participants responding to Survey 4 (46 responses) was significantly less than for the other three surveys (119 for Survey 1 and 2, 102 for Survey 3); this likely resulted in the lack of statistically significant changes between Survey 4 and the previous surveys.

Concerning the patient communication course, optometry students overwhelmingly believed that discussions on race, cultural competence and personal bias have a place in optometric education. These results are consistent with results found in medical student education by Bright and Nokes 2019; however, our study did not have a non-learner control group. In addition, our methodology differed slightly from Bright and Nokes in that our study did not contain an active, in-person discussion with an outside trained facilitator. Our data might have been biased because students did not have the opportunity to have open, frank and honest discussions with an outside trained facilitator. In that scenario, students may be more apt to discuss feelings that may be uncomfortable to share with a faculty member with whom they have an ongoing relationship. Students felt comfortable discussing race with patients and other health professionals. Learners were also content in discussing how race impacts health outcomes. Not only did optometry students agree that these discussions are meaningful, they also displayed an initial quantifiable increase in their level of understanding on these topics.

Two items in the surveys ? experience with racial microaggressions and incidents of institutional racism ? were notable. According to Sue, "Racial microaggressions are brief and commonplace daily verbal, behavioral, or environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial slights and insults toward people of color."[27] We investigated the item on the students' experience with racial microaggressions, and it was not statistically significant. In contrast, these two survey items were statistically significant in the study conducted by Bright and Nokes, 2019. However, it is important to note the differences in the participant groups between Bright and Nokes and our study. 61% of the participant group in the Bright and Nokes study identified as a racial minority, while 26% of the participant group in our study identified as a racial minority, which may have lessened the effect of the survey item. Additionally, the item regarding encountering institutional racism is salient to our study. The impact of the modules doubled the number of students who reported experience by themselves or others with institutional racism in optometry school. Thus, our students may suffer angst in some optometry school situations, but not conceptualize that it is in fact a form of racism. This item was not statistically significant, but the raw numbers increase from pre-to post-survey is remarkable. This suggests that an increase in knowledge about institutional racism is required to begin taking steps to reduce it.

For each course, self-reflection was integral in understanding how students assimilated the material and applied their understanding to mitigating biases and improving patient communication. This form of learner-driven learning is beneficial with concepts such as addressing the cause of health disparities.[28]

Limitations on external observations and community outreach typically required for these courses imposed by the COVID-19 pandemic created an opportunity to investigate these concepts in the selected courses. To accommodate these curricular requirements for future class cohorts, course

instructors are investigating how to streamline course objectives and create a more cohesive assignment set spanning the four academic terms prior to students starting their third academic year and clinical rotations.

A limitation of these results is that the survey questions were created for this intervention and had not been validated prior to this intervention. Validating the survey or using a validated study that addresses the study questions would strengthen the data. This work would benefit from additional survey points. All surveys were conducted during the second academic year, and this cohort began their clinical exposure as third-year students. A survey conducted after students have been involved in patient care may yield additional insight into retained impact of the material covered. Additionally, the course design could benefit from inclusion of cases that allow for the application of communication and empathy skills as well as further training on structural competence. Some changes have been incorporated into the subsequent version of the courses. A comparison between cohorts involved in the course in summer 2020 and summer 2021 may provide insight into the value of additional components. In assessing the impact of this intervention on health outcomes, this study would benefit from monitoring patient data over time.

Conclusion

Understanding racial and ethnic health disparities and the factors that influence health outcomes in patients is vital for optimal patient care. The task of educating students on such matters is not a small endeavor. This paper examined topics of implicit bias awareness, empathy and patient communication to influence learners' appreciation of how race impacts the health outcomes of patients. Students believe that race should be discussed throughout the optometric curriculum. With the use of learner-driven techniques such as self-reflection, students' understanding of the role race has in health disparities increased throughout each course along with confidence in providing fair and equitable treatment for patients. This improvement has the potential to enhance provider-patient interaction and ultimately health outcomes. Unfortunately, the gains achieved were short-term, underscoring the need to weave diversity, equity and inclusion concepts throughout the optometric program. This will not only facilitate understanding but also reinforce concepts to aid retention.

An unexpected component to note is that as student consciousness around the health effects of racism increased, so did the number of students who reported experience with racism. This awareness is not a negative, but a critical first step in addressing the issues. Overall, discussing racism and its effects on racial health disparities is important in optometric education to equip our students to provide the best patient care.

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Appendix A. Click to enlarge

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