

Utilizing a Structural Competency Framework for Anti-Racism Training
with Healthcare Students, A Quality Improvement Project

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Abstract

Background

The purpose of this pilot project to be offered in partial completion of Oregon Health & Science's (OHSU) Doctor of Nursing Practice (DNP) program is to assess the efficacy of a specific type of anti-racism training for graduate nursing students. The pilot will show how the material is received and determine if it should be delivered to a broader audience. The paradigm to be tested is an educational framework created by Dr. Jonathan Metzl of Vanderbilt University. It is called "structural competency" and approaches racism-related barriers to health equity from an intersectionalist perspective, connecting the dots amongst healthcare, transportation, job, housing, and other inequalities.

Methods

Participants were given pre-tests to determine baseline understanding of content prior to completion of education module and post-tests to determine understanding of content after completion of education model. Pre-tests and post-tests were identical and included a combination of open-ended questions for short answers and case study questions for answers by Likert scales. Answers were compared between pre- and post-tests to assess for changes in understanding of content related to completion of education module. Four key questions were pulled from case studies for quantitative statistical analysis by paired t-test using IBM SPSS Statistical Software to capture data on participant 1) understanding of the relationship between socioeconomic status, healthcare, and medicine, 2) understanding of the relationship between racism and healthcare, 3) perspective on whether people's view on race impacts behavior, and 4) perspective on whether their own view on race impacts their own behavior.

Participants

Participants were students registered for Health Promotion and Protection class at the Master's and Doctorate level (Nursing 514 and Nursing 714, respectively) at Oregon Health & Science University in Portland, OR. Only data from Nursing 714 students was included in the final analysis, however, due to post-test loss in the Nursing 514 group. Participants' well-being was protected by the Institutional Review Board's approval and the offering of counseling resources.

Results

Students' understanding of the impact of structural racism on healthcare equity improved following project implementation, supporting utilization of Metzl's framework for anti-racism education with graduate nursing students. Both the qualitative analysis of open-ended questions and the quantitative analysis of the four key questions from case studies showed improvement when comparing pre- and post-test answers. For the 1st two of the four key questions, 1) understanding of the relationship between socioeconomic status, healthcare, and medicine (95% CI [3.73, 4.47] M= 4.10, SD= 0.70 and 95% CI [4.17, 4.83] M= 4.5, SD= 0.63), and 2) understanding of the relationship between racism and healthcare (95% CI [3.46, 4.33] M=3.46, SD= 0.83 and 95% CI [4.34, 4.86] M= 4.6, SD= 0.49), statistically significant improvement via paired t-test was shown when comparing pre- and post-tests. For the 2nd two of the four key questions, 3) perspective on whether people's view on race impacts behavior (95% CI [4.17, 4.83] M= 4.50, SD= 0.63 and 95% CI [4.46, 4.94] M=4.70, SD= 0.45), and 4) perspective on whether their own view on race impacts their own behavior (95% CI [4.02, 4.78] M= 4.40, SD=

0.72 and 95% CI [4.27, 4.92] $M=4.60$, $SD= 0.62$), paired t-test did not demonstrate statistically significant improvement when comparing pre- and post-tests.

Implications for Practice

Given the massive disparities that exist in the United States when looking at health outcomes for people of color, it is imperative that healthcare providers be educated about the barriers to equity that exist due to structural racism. A critical influence point in which to reach healthcare providers is during their education. The outcome of this pilot project demonstrated that utilizing Jonathan Metzl's framework for structural competency education did lead to increased student understanding of structural racism and health equity concepts. It is anticipated that this increased student understanding will lead to enhanced provider advocacy for health equity and improved patient outcomes.

I. Introduction: The Clinical Problem

A. Description of the health system problem

There is a nearly 20% disparity gap between overall mortality of Black Americans versus White Americans (Cunningham et al., 2017), with massive differences in morbidity between the two groups. For example, the rates of hypertension are almost 40% greater for Black Americans than for White Americans (Brondolo et al., 2011). The current Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-Cov-2) pandemic further illuminates the impact of these health inequities in a timely and tragic manner. Data related to race, infection, and death rates is being tracked at the city, state, and national levels, and shows disproportionate caseloads amongst Black communities. For example, Chicago, Illinois and New York City, New York both show disturbing trends as Black residents comprise 44.6% and 32.6% of total captured SARS-Cov-2 infections, and 54.7% and 33.2% of case fatalities, yet only account for 30.1 and 24.3% of the city populations, respectively (City of Chicago, 2020; City of New York, 2020). At the state level, Michigan's disparities are even more alarming. Black residents account for 33% of SARS-Cov-2 infections, and 40% of related deaths, yet only account for 14.1% of the total state population (State of Michigan, 2020). Finally, data from the United States as a whole reveals that 30.1% of SARS-Cov-2 infections are in Black residents, yet only 13.4% of the country's population is Black (CDC, 2020).

How do we account for these huge variations in numbers? Structural racism could explain it easily. In regards to hypertension, not only are Black communities living in a constant state of hyperarousal and hypercortisolemia that lends itself to elevated blood pressures (Brondolo et al., 2011; Rodgers, 2018) related to fear around police brutality, lack of job access, and constant macro- and microaggressions based on race, but these communities have

diminished access to health insurance, health assessments, and hypertension treatments (Garcia & Sharif, 2015; Rodgers, 2018). Related to SARS-Cov-2, people of color have increased exposure to the virus related to lower-wage essential worker functions, juxtaposed on top of decreased access to care and increased comorbidities including hypertension as stated above.

These types of health disparities are well-documented across the literature, and an important aspect of healthcare training. The study of health disparities has become an established although brief part of most medical and nursing education curriculums throughout the United States, and many of these programs even address the presence of race-specific inequalities that include health inequities. However, the established majority of these health education curriculums take an approach of “cultural competency” that emphasizes individual interactions between the healthcare provider and the patient (Metzl & Hansen, 2014). This is different than a “structural competency” approach that identifies the intersectionality of institutionalized systems of oppression such as food systems, job systems, and transportation systems, and the impact these have on health outcomes. As few programs address anti-racism training with a structural approach, students may view racism-related health disparities as singular, without the context of the greater institutions maintaining the status-quo. Further, as these students transition into practice, they may not have the ability to connect the various factors of oppression in meaningful ways. This could lead to a lack of information needed to dismantle the systems burdening their patients.

The few programs that have embraced a structural competency model for teaching this topic to students have little to no hard data demonstrating the efficacy of this educational framework. Specifically, there is a lack of objective, quantifiable data that addresses changes in student perspective or analyses of patient outcomes once the provider is educated about

structural competency. If the current education system can be disrupted and transformed to teach students how to question established institutions that maintain the status quo, then there will be the real possibility of dismantling those systems and creating policies that protect and uplift all members of society. However, there must be the evidence to support it.

B. Review of the literature

The amount of existing literature addressing the topic of structural competency is growing, but there is still a dearth. A review of the current literature was performed between October 2018 and May 2019. Electronic searches were conducted utilizing the Oregon Health & Science University library, Vanderbilt University library, the National Institute of Health literature database, PubMed database, Wiley Library database, Journal of the American Medical Association (JAMA) Network database, and the Science Direct database. Filters used included “structural competency training”, “racism AND health disparities”, “racism AND health inequities”, and racism AND structural competency”. The search yielded 385 articles, of which less than ten were randomized controlled tests. Additional searches were made using the search terms “racism AND structural competency AND randomized controlled trials” which yielded no results. From the original grouping, only English-language articles published within the last 7 years in peer-reviewed journals were included. This gleaned 11 articles. Out of these 11 articles, 8 were published within the last three years, increasing their impact on the current health policy climate (Metzl et al., 2018; Neff et al., 2016; White-Davis et al., 2018; Bailey et al., 2017; Hardeman et al., 2016; Came & Griffith, 2018; Hansen et al., 2018; and Doede, 2016). All of the articles summarized in this paper were deemed appropriate and most relevant for influencing the future research goals and potential policy shifts, which are the ultimate objectives of this investigation.

The following themes were found amongst the articles: structural competency approach to anti-racism trainings, methodology issues, and gaps in the literature. All eleven articles advocated for a structural competency approach to anti-racism trainings in medical and nursing school curriculums. They all were in agreement that cultural competency trainings are somewhat dated in their approach. Given the current political climate, it does seem that a systems-based approach is more relevant.

All of the studies had strong qualitative components to them, except for Chae et al. (2015), whose study was strongly quantitative but not specifically related to structural competency training. This study was a foundational work, linking geographical areas of racism with higher rates of black mortality. The remaining ten studies aside from Chae et al. (2015) were either expert opinion or qualitative surveys with quantitative analysis of the found data. While expert opinion can be impressively influential upon policy, it is inherently subjective and thus does not reach the same level of evidential prowess that could be found in a clinical trial. Six out of the eleven included studies specifically addressed the impact of structural competency trainings on healthcare students and residents (Hansen et al., 2018; White-Davis et al., 2018; Neff et al., 2016; Metzl & Hansen, 2013; Metzl et al., 2018; and Feagin & Bennefield, 2014). All of these demonstrated improved understanding by the students and residents after completion of the trainings. Half of those utilize independent, quantitative analysis (Metzl et al., 2018; White-Davis et al., 2018; and Neff et al., 2016). Only one study (Feagin & Bennefield, 2014) is a meta-analysis.

The most profound gaps in the literature are centered around the lack of strong, quantitative data demonstrating improved participant structural competence after specific trainings. However, this may be viewed as a challenge of the subject material itself, as opposed to a

critique of the authors' methods. The topics of racism, health disparities, inequality, and structural competency lend themselves more easily to descriptive statistics than to purely quantitative methods. While the philosophical, ethical, and qualitative tenets are fairly well-explored, actual pre-training and post-training evaluations to determine the efficacy of the educational modules are lacking. With only a few articles providing this type of analysis (Metzl et al, 2018; Neff et al., 2016; White-Davis et al., 2018; Chae et al., 2015), it is difficult to definitively determine whether or not this type of specific training actually impacts provider understanding and the ability to offer competent care. While the study of slavery, Jim Crow laws, and other historical influences are beyond the scope of this study, a deep understanding of the problem and the context of how and why structural racism came to guide so many American policies is a necessary prerequisite to finding a solution. Now the time has come to actively delve into the problem with a toolbox of solutions and healthcare providers ready to advance health equity.

Reflecting upon the literature, one can see that health disparity critique is a part of most medical and nursing education programs in the United States. The articles by Bailey et al., 2017; Came et al., 2015; and Doede, 2016 give solid evidence about how and why systemic health disparities affect the population at the individual, community, and societal levels. This contribution to the field cannot be understated, as these strong foundational themes allow additional research to explore the topic more deeply. Further, many of the articles examined in this literature review explicitly state the need for education specific to structural competency training as opposed to cultural competency training only (Metzl et al., 2013; Metzl et al, 2018). The impact of these articles is monumental in opening up an entire subfield of health

disparity study. These contributions, most specifically the repeated contributions of Dr. Jonathan Metzl, have truly helped develop an arena for further inquiry.

C. Framework & Rationale

The framework that will be used for this DNP project is a structural competency framework developed by Jonathan Metzl, MD, of Vanderbilt University. Dr. Metzl's office granted permission for his work to be used in this pilot project. This model postulates that racism is multi-faceted and deeply institutionalized in the United States, affecting everything from job access to transportation to housing to safety. Further, this framework is built on the premise that these different facets of life are inextricably intertwined, and highly impactful upon individual's ability to access competent healthcare.

This intervention (the structural competency education model) is expected to work (ie., improve students' understanding of institutionalized racism and increase their structural competency levels) because previous testing done by Jonathan Metzl has shown success. However, he has only tested this model of training on physician residents and pre-health students, so the assumption was made that these results could be extrapolated to other types of students (ie., advanced practice nursing students).

D. Purpose & Aims

The aim of this DNP project is to improve students' knowledge of structural racism, as well as to provide objective data supporting the use of Jonathan Metzl's structural competency framework in graduate nursing programs' anti-racism training. While many nursing and medical education programs address (at least superficially) health disparities related to racism, most of these stem from a cultural competency model. A structural competency model is more comprehensive and appropriate for teaching healthcare providers the nuances of institutionalized

racism and how to dismantle those systems; however, there is a dearth of objective data demonstrating the efficacy of this model of training.

II. Methodology & Approach to the Conduct of the Project/Methods

A. Setting

This pilot project took place within the confines of Nursing 514 and Nursing 714 (Health Promotion and Protection for Masters and Doctoral nursing students, respectively), at Oregon Health & Sciences University, during the Winter and Spring 2020 quarters. The project was presented online, utilizing the software Sakai. The education and testing occurred as part of a greater healthcare disparities course for these students. By engaging with students when they were already in the mindset of learning about health disparities, their readiness to change was anticipated to be higher. However, challenges still existed. Namely, when approaching a topic such as racism, peoples' defenses can rise and their willingness to learn can decrease (Nelson, 2014). Additionally, the backgrounds and experience of the student body was extremely varied. Some students had never participated or had participated only minimally in prior anti-racism trainings, while others had participated in many trainings. Thus, presenting the material in a way that was meaningful to students of various background was challenging.

B. Participants

Participants were included if they were registered for the classes chosen to host this project, Nursing 514 and 714. A total of 18 students participated between these two classes; however, due to loss of post-test data from the Nursing 514 class, only data from the 14 students in the Nursing 714 class was included in the final analysis. 58% of the participants self-identified as white, 42% self-identified as mixed-race, and none self-identified as black. Two-thirds of the participants self-identified as cis-female, almost one-third self-identified as cis-male, and one

participant identified as non-binary gender. 90% of the participants planned to work in primary care or community care settings after graduation, with 10% planning on working in acute-care settings. Participants were protected by project approval and recommendations of the OHSU Institutional Review Board. Counseling resources were offered to all participants both at the beginning and the end of the project. The small number of participants was a definite challenge of this project; however, as a pilot study, this project does have the potential to be delivered to a much larger audience in the future.

III. Implementation and Outcome Evaluation

A. Intervention Description & Evolution

The intervention that was tested was Jonathon Metzl's structural competency education module (Metzl et al., 2018). Students received a pre-test prior to the education module in order to determine their baseline understanding of institutionalized racism and its effects upon healthcare disparities. Then, the education module was presented. The module was comprised of a short lecture, required readings from scholarly journals, forum discussions, and a reflection paper. After completion, students completed a post-test to determine if understanding of the concepts increased with the education.

The pre- and post-education tests were identical, and were developed by modifying Jonathon Metzl's original work (Appendix A). The test questions not immediately relevant to the training were omitted, and additional case studies were developed to augment the test. The objectives of the module included students' completion of forum discussion requirements (namely, at least one substantial and original post, and two thoughtful responses to colleagues' posts, that demonstrated integration of lecture material and scholarly resources), and post-

module assessments demonstrating increased understanding of structural racism as compared to pre-module assessments.

Over time, there was an evolution of the implementation. For example, the final testing methods that were used were an amalgamation of Likert scales and open-ended questions to evaluate students' basic understanding of the content. Although originally it was proposed to test via Likert scales only, the written answers gleaned from the open-ended questions were considered too valuable to forgo, even at the expense of research objectivity. Four of the questions answered by Likert scales were prioritized for robust statistical analysis. These questions were chosen based on their informational value. If every question had undergone the same level of statistical analysis, the final product would have been diluted and time constraints could not have been met.

The project evolved to become increasingly specific and refined. Originally, many more questions were to be included but this was deemed overly cumbersome and would have been too time-consuming for the participants. Through this pilot project, the researcher was able to note which questions were most profitable in terms of assessing student understanding of the content. It did become clear that fewer questions would allow more in-depth analysis and would glean more useful information.

B. Measures/Outcomes

a. data collection sources, processes, procedures and rationale

Utilizing pre- and post-education testing helped to differentiate if the change over time (in this case, the increased understanding by the students) could be attributed to the tested intervention. As previously noted, the testing format used was a modification of testing used by Jonathan Metzler at Vanderbilt University. Answers to case study questions were organized in a

way so that a “5” on the Likert scale was associated with a strong understanding of the concepts, and a “1” was associated with the weakest understanding of the concepts. The goal was to have students’ scores increase (ie., a higher mean score after completing the education module, analyzed by a paired t-test). An example for clarification would be “The following is an example of a structural barrier to healthcare access that would decrease medication compliance: buses from patient’s house to the pharmacy do not run past 5 pm.” 1-strongly disagree, 3-neutral, 5-strongly agree (the answer should be 5). This would be in contrast to a non-structural barrier, such as “patient did not like the flavor of the medicine”. By utilizing Likert scales, numerical representations of student understanding were established in order to simplify the statistical analysis process.

b. use of information systems and technology

Since this project was offered to participants via an online platform, Sakai software was used. Survey Monkey was used for distribution and collection of pre- and post-tests. The IBM software SPSS was utilized for statistical analysis of the obtained data. This was a low-technology project.

c. how accuracy of data collected was ensured

Likert scales are considered reliable tools for measuring and organizing data. Likert scales were chosen because this project needed a way to categorize student answers to the case-study questions that could be quantified. Unfortunately, validity is difficult to ascertain in self-reporting surveys because of the potential for response bias. For example, participants may have felt like choosing a specific answer may make them appear more or less knowledgeable about the content. Participant anonymity was maintained throughout the testing to maintain participant privacy and reduce the possibility of researcher bias.

d. missing data

During the testing process, four post-tests were lost due to participant attrition. Without the post-tests, the pre-tests from that group were essentially meaningless. Therefore, they were disregarded in the final statistical analysis. It was determined that the participant attrition was due to misunderstanding, ie the participants had not realized they must answer the post-test questions.

e. ethical considerations

The greatest ethical consideration was the potential for moral distress amongst participants. Learning about the impact of racism, and self-reflection upon the role one might play as an individual in maintaining the current systems, can cause distress. Additionally, the content could have been triggering for people of color in the classes. Participants were given counseling referrals to access as needed. There were no conflicts of interest identified.

f. costs

There were no costs associated with this project.

C. Unintended Consequences

One potential positive unintended consequence was that the mere offering of the educational module could cause participants to reflect and do self-study of the content. This could lead to increased understanding and behavior modification outside of the influence of the actual module content. No negative unintended consequences were identified.

D. Key Findings

Overall, students' understanding of the impact of structural racism on healthcare equity improved following project implementation, supporting utilization of Metztl's framework for anti-racism education with graduate nursing students. Both the qualitative analysis of open-

ended questions and the quantitative analysis of the four key questions from case studies showed improvement when comparing pre- and post-test answers. Written answers to the open-ended questions such as “Define structural racism” were noted to have increased detail and specificity after the module completion. Particularly, the words “systems”, “structures”, and “institutions” were used in 43% responses in the pre-test and 79% responses in the post-test (Appendix B). These words were chosen as they represent a macro, organizational perspective.

To analyze the four key questions, a paired t-test was used so as to compare the responses before and after the intervention. For the 1st two of the four key questions, 1) understanding of the relationship between socioeconomic status, healthcare, and medicine and 2) understanding of the relationship between racism and healthcare, *statistically significant improvement was shown* when comparing pre- and post-tests via paired t-test with a 95% confidence level. The statistics demonstrated a mean Likert value of 4.1 increasing to 4.5 for the 1st key question, when a Likert 4 translated to the student self-rating their understanding of the relationship between socioeconomic status, healthcare, and medicine as “good” and a Likert 5 translated to the student self-rating their understanding as “excellent” (Appendix C). Similarly, the statistics demonstrated a mean Likert value of 4.3 increasing to 4.6 for the 2nd key question, when a Likert 3 translated to the student self-rating their understanding of the relationship between racism and healthcare as “okay”, a Likert 4 translated to a self-rating of “good”, and a Likert 5 translated to a self-rating of “excellent” (Appendix C).

For the 2nd two of the four key questions, 3) perspective on whether people’s view on race impacts behavior, and 4) perspective on whether their own view on race impacts their own behavior, paired t-test *did not demonstrate statistically significant improvement* when comparing pre- and post-tests. The statistics demonstrated a mean Likert value of 4.5 increasing to 4.7 for

the 3rd key question, when a Likert 3 translated to a student believing a person's view on race "somewhat" impacted their behavior, a Likert 4 translated to a student believing a person's view on race impacted their behavior "quite a bit", and a Likert 5 translated to a student believing a person's view on race impacted their behavior "very much" (Appendix C). Similarly, for the 4th key question, the statistics demonstrated a mean Likert value of 4.4 increasing to 4.6, with translations of Likert scale being the same as for the 3rd key question (Appendix C). The last key finding was related to a case study presented to participants about a patient who was non-compliant with her medication (amlodipine). They were given a variety of potential explanations for the non-compliance and were asked to identify the explanations related to structural racism. The correct answers were that amlodipine was not covered at the same rate as lisinopril by insurance, and that buses going from the patient's house to the pharmacy did not run after 3 pm. 70.1% of students identified the insurance coverage prior to completing the education module versus 78.6% after the module, an improvement of 8.5% (Appendix D). 94.1% of students identified the transportation issue prior to completing the module versus 100% of students after the module, an improvement of 5.9% (Appendix D).

V. Outcomes

A. Comparison to Expected Results

Overall, including both subjective researcher observation of the changes between students' pre- and post-tests as well as the quantitative analysis of key questions, it does appear that there is a greater understanding of the impact of racism upon health equity issues after the education module was completed. However, the improvement was less than anticipated, and in fact was shown to be statistically insignificant for two of the four key questions, which was not

expected. Students did have greater baseline understanding of the concepts prior to completing the education module than had been anticipated.

B.Explanation of Key Differences

The differences between actual results and expected results can be explained by several factors. First, there is room for improvement regarding the actual testing. Fewer questions allowing more in-depth answers by students and analysis by the researcher could provide clearer results. As it was, there were challenges developing a clear system to create quantitative comparison, allowing room for errors. The Likert scales were adequate but cumbersome. Second, this module would likely perform better if it was presented more slowly over time. This module could really be an entire class on its own as opposed to a single module within an existing class. By presenting the material more slowly, the teacher could include more detailed information and allow students to digest and process the content more thoroughly. Third, there were aspects of questions that were likely not appropriate for the participant group. For example, in the medication noncompliance case study, students would have needed to know that amlodipine is a calcium-channel blocker and 1st line treatment for hypertension in black patients, versus lisinopril which is an ace-inhibitor and 1st line treatment for hypertension in white patients. Given that some of these participants had not yet practiced as providers, they may have been confused by this question.

E. Impact of Project on System

This pilot study has the potential to greatly impact the current educational system for advanced practice nurses. In fact, it has the potential to impact the educational system for all healthcare students. Given its lack of financial cost, there really are no major barriers to implementing MetzI's framework as part of robust anti-racism training. Looking further,

integrating more holistic anti-racism training will provide the healthcare system with more aware and better-prepared providers. It is anticipated that this will ultimately lead to improved patient outcomes.

VI. Implications for Practice, Recommendations/Limitations, and Conclusion

The implications for practice provided by this pilot project are vast. Accessing future providers while they are still students is useful because they are still formulating ideas and perspectives on healthcare. It is the perfect time to present anti-racism training including Metzl's framework on structural racism. Graduating entire classes of new providers well-trained in equity work has the potential to shift the healthcare system in a direction that better protects those who have been oppressed for generations. Further, the project is low-footprint and no-cost, increasing its sustainability.

Moving forward, it is the recommendation of the researcher to present anti-racism training to graduate nursing students through a lens of structural competency as tested in this project. Opportunities exist as previously stated to expand the influence of this project by presenting this education module to other classes, such as undergraduate nursing students, medical students, and ancillary healthcare professional students including physical therapy students and physician assistant students. Additional opportunities lie within the expansion of this tested education module to create an entire course, to be presented over an academic quarter or semester. The module could also be presented as a continuing education course for healthcare providers. A condensed version could be presented over a 2-day workshop. The limitations are surmountable by further refining the testing capabilities presented in this project, and doing outreach to more academic institutions in order to have them adopt this approach.

VII. Summary and Opportunities for Further Inquiry

Given the massive disparities that exist in the United States when looking at health outcomes for people of color, it is imperative that healthcare providers be educated about the barriers to equity that exist due to structural racism. The outcome of this pilot project demonstrated that utilizing Jonathan Metzl's framework for structural competency education did lead to increased student understanding of structural racism and health equity concepts. It is anticipated that this increased student understanding will result in enhanced provider advocacy for health equity and improved patient outcomes.

Questions for further inquiry could include investigations into whether or not students and providers who complete this education actually demonstrate practice changes, and whether or not patients of these providers demonstrate improved health outcomes. Further, it will be important to investigate the best way to test these questions. Since the ultimate goal is to improve patient care, it would be prudent to investigate these downstream effects. In all cases, for all students, providing robust anti-racism training is imperative to help counteract the systems of oppression that adversely affect our patients. The structural competency framework is an effective and meaningful approach as proven by this pilot project.

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Appendix A (Pre- and Post-test)**Structural Racism and Health Disparities**

Thank you for completing this questionnaire in partial completion of a pilot project investigating anti-racism training. Your answers will be kept anonymous. Thank you for answering as honestly as possible.

1. What specialty are you planning on working in upon graduation?

- Community health
- Primary care (private or group practice)
- Public health (policy development, etc.)
- Acute care (hospital, urgent care, etc.)
- Education
- Other (please specify) _____

2. I identify my race/ethnicity as:

- Black/African American
- White/Caucasian
- Hispanic or Latinx
- Asian/Pacific Islander
- Native American
- Multiracial
- Other (please specify) _____

3. I identify my gender as

- Ciswoman
- Transwoman
- Transman
- Cisman
- Nonbinary, Two-spirit, or Gender-fluid
- Other

4. Prior to this module, how many anti-racism courses have you completed?

- 0
- 1
- 2
- 3 to 5
- More than 5

**5. In your opinion, what are the three most important influences on people's health?
(List and number each influence as 1, 2, 3. 1 is most important).**

6. Please define the term “structural racism”.

7. The following statements inquire about your knowledge or skills in different areas. For each item, indicate your level of knowledge or skill. Mark only one answer for each item.

	Poor (1)	Not very good (2)	Okay (3)	Good (4)	Excellent (5)
Understanding of relationship between health, socioeconomic factors, & medicine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall knowledge of American health system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Understanding of impact of chronic stress on health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to work cooperatively with diverse people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Critical thinking skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to discuss and negotiate controversial issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Understanding of connection between racism and health inequities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you. Mark only one answer for each item.

Not at all A little bit Somewhat Quite a bit Very much

	like me (1)	like me (2)	like me (3)	like me (4)	like me (5)
I believe it is important to analyze & understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Not at all like me (1)	A little bit like me (2)	Somewhat like me (3)	Quite a bit like me (4)	Very much like me (5)
our own thinking processes					
I don't enjoy discussions where causes for people's behavior are talked about	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am very interested in understanding how my own thinking works when I make judgements about people or attach causes to behavior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think a lot about the influence that society has on other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think a lot about the influence that society has on my behavior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think that people's views on race impact their behavior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think that my view on race impacts my behavior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Please read the following vignette and respond to the questions below.

Mrs. Demetilla Hernandez is a 63-year-old Cuban woman who went to the Freewell HMO clinic because of weakness, lethargy, and fatigue that she has experienced for the last two months. A week ago, while cooking dinner at her daughter Mariana's house, she lost her balance and slipped on the kitchen floor. Although she sustained only a mild bruise on her leg, Mariana insisted on taking her to the clinic for a check-up because of her persistent symptoms.

I would add questions directly under each vignette to make it easier to respond

Mrs. Hernandez, widowed four years ago, lives with Mariana, aged 40, who is divorced and has three children: Luis, 15; Carolina, 10; and Sofia, 7. Mrs. Hernandez manages the household while Mariana is at work. Mrs. Hernandez prepares the family's meals, attends to the children when they come home from school, and performs light housekeeping chores. Because Mrs. Hernandez cannot speak English, the family language at home is Spanish.

At the Freewell clinic, Mrs. Hernandez was given a variety of tests and diagnosed with a form of diabetes. The physician prescribed a medication and advised Mrs. Hernandez through her daughter to undergo a period of bed rest and to limit her food intake to 1500 calories a day. He also requested that Mrs. Hernandez return monthly to the afternoon walk-in patient clinic to have her blood sugar level checked. Mrs. Hernandez became a little agitated, explaining to her daughter that she thought that the traditional Cuban dishes she prepares are very healthy. Mrs. Hernandez told her daughter that instead of buying the prescribed medicine, perhaps she should go to the botanica and obtain some herbs that would help to lower her blood sugar. When Mariana relayed Mrs. Hernandez's concern, the physician showed the daughter the results of her mother's tests and underscored the potential seriousness of her condition.

Directions: What are the three most important questions you would ask to understand this case? Why are these questions important? Type your responses in the text boxes provided below.

First question you would ask?

Explain why you would ask this question.

Second question you would ask?

Explain why you would ask this question.

Third question you would ask?

Explain why you would ask this question.

10. Black men are 30% more likely to die from heart disease than non-Hispanic white men.

Directions: Choose the 3 factors which best explain the findings above. Indicate the most important, second most important, and third most important factor. Explain your answer in the space provided below.

	Most important factor important factor	Second most important factor	Third most
Access to healthcare	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cultural background	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Genetic factors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health delivery system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health literacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health traditions/beliefs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Individual lifestyle choices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Individual or family income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Institutional racism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medicalization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neighborhood factors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provider bias	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain why the 3 factors you selected above are important for understanding this disparity in heart disease. _____

11. Mrs. Roberts is a 37-year old Black female with hypertension who lives in a neighborhood that is comprised of approximately 60% Black residents, 30% Latinx residents, and 10% White residents. Mrs. Roberts has been prescribed daily amlodipine to control her blood pressure. She has been only minimally compliant with this prescription.

Directions: Circle the potential reasons for noncompliance that are related to *structural racism*.

Medication not covered by insurance at same rate as lisinopril.

Medication leaves bad aftertaste.

Bus going to pharmacy does not travel through neighborhood after 3 pm.

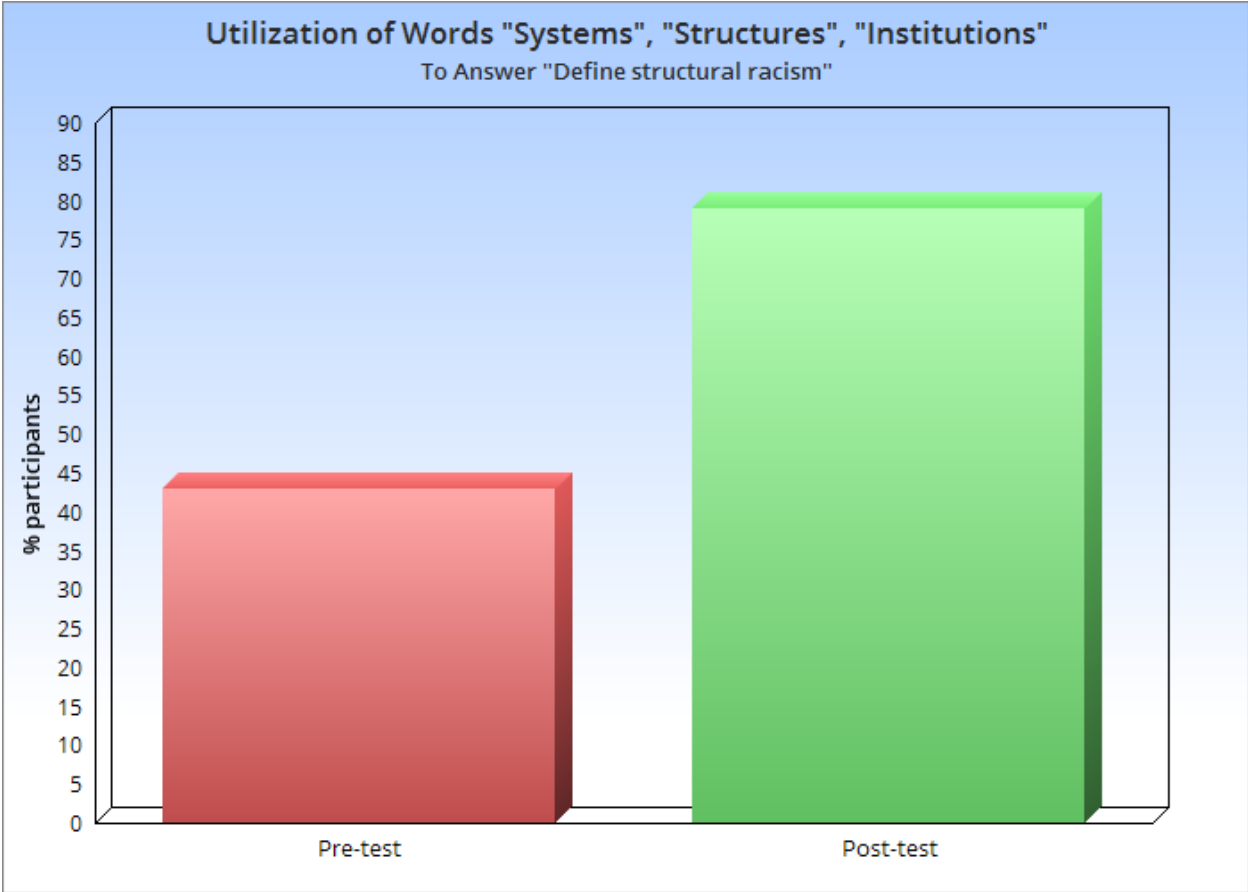
Patient is allergic to medication.

Prescribing provider did not explain reason for taking medication.

Patient does not trust prescribing provider.

Appendix B

Use of the words “systems”, “structures”, and “institutions”, when asked to define the concept of structural racism, rose from 43% to 79% after completion of education module.





Appendix C

Statistical Analysis of Four Key Questions

	Concept	Confidence Interval	Lower, Upper Limits	Mean	Standard Deviation	Statistically Significant?
1)	Understanding of the relationship amongst socioeconomic status, healthcare access, & medicine (pre-test)	95%	3.73, 4.47	4.1	0.7	YES
	Understanding of the relationship amongst socioeconomic status, healthcare access, & medicine (post-test)	95%	4.17, 4.83	4.5	0.63	
2)	Understanding of the relationship between racism and healthcare (pre-test)	95%	3.46, 4.33	3.46	0.83	YES
	Understanding of the	95%	4.34, 4.86	4.6	0.49	



	relationship between racism and healthcare (post-test)					
3)	Perspective on whether people’s view on race impacts behavior (pre-test)	95%	4.17, 4.83	4.5	0.63	NO
	Perspective on whether people’s view on race impacts behavior (post-test)	95%	4.46, 4.94	4.7	0.45	
4)	Perspective on whether their own view on race impacts their own behavior (pre-test)	95%	4.02, 4.78	4.4	0.72	NO
	Perspective on whether their own view on race impacts their own behavior (post-test)	95%	4.27, 4.92	4.6	0.62	

- **Key:**

For questions 1 & 2,

Likert 1: student self-ranked understanding as “poor”

Likert 2: student self-ranked understanding as “not very good”

Likert 3: student self-ranked understanding as “okay”

Likert 4: student self-ranked understanding as “good”

Likert 5: student self-ranked understanding as “excellent”

For questions 3 & 4,

Likert 1: student believes view on race impacts behavior “not at all”

Likert 2: student believes view on race impacts behavior “a little bit”

- Likert 3: student believes view on race impacts behavior “somewhat”
- Likert 4: student believes view on race impacts behavior “quite a bit”
- Likert 5: student believes view on race impacts behavior “very much”

Appendix D

Percentage of students identifying insurance barriers as cause for medication non-compliance rose from 70.1% to 78.6%, and percentage of students identifying transportation barriers as cause for medication non-compliance rose from 94.1% to 100% when comparing pre-test and post-test answers.

