

Structural Competency: Evaluation of Qualitative Results of Pilot Study

by

Christie Calogero

A Senior Honors Project Presented to the

Honors College

East Carolina University

In Partial Fulfillment of the

Requirements for

Graduation with Honors

by

Christie Calogero

Greenville, NC

December 2021

Approved by

Courtney Caiola, PhD, MPH, RN, CNE

East Carolina University, College of Nursing

Table of Contents

Abstract.....	3
Background and Significance.....	4
Review of Literature.....	5
Search Methods.....	5
Search Results.....	6
Discussion.....	9
Study Purpose.....	11
Data Collection.....	11
Ethics.....	12
Data Management & Analysis.....	12
Results.....	13
Sample.....	13
Acceptability.....	14
Appropriateness.....	14
Feasibility.....	14
Discussion.....	15
Conclusion.....	15
Appendix A	17
References.....	18

Abstract

Structural competency is an approach to training healthcare providers to address social and structural barriers that impede certain communities from receiving equal and quality healthcare. The purpose of this project was to 1) explore the published literature regarding structural competency and how it has been applied in healthcare professional training, and 2) analyze the qualitative data from an educational pilot study implementing an adapted structural competency curriculum for acceptability, appropriateness, and feasibility. Literature searches were conducted in PubMed and CINAHL Plus with Full Text, as well as a manual search of the <https://structuralcompetency.org/> website. A total of 111 articles were retrieved after duplicates were removed, ten (N=10) studies met the inclusion criteria, and findings are synthesized to describe the timing and settings of the structural competency training, types of teaching and learning activities used, measurements of outcomes and the levels of proficiency achieved. After this review, content analysis was used to examine the qualitative data from the structural competency pilot education study called Health Equity Advanced Through Structural Competency (HEAT-SC). Results from this preliminary data support that an adapted structural competency curriculum was acceptable, appropriate, and feasible. These results suggest that the adapted curriculum could be implemented on a larger scale to contribute to the fight against health inequities in eastern North Carolina.

Background and Significance

Health equity is the concept of having all communities with the ability to receive quality and equal healthcare (CDC, 2021). The goal of health equity is to assist people in living the healthiest lives possible no matter their position in society (Achieving health equity, 2021). Unfortunately, in rural eastern North Carolina (NC) there are many determinants of health and structural barriers contributing to health inequities. Studies have shown that compared to urban areas, people living in rural areas have worse health outcomes and less access to healthcare. For example, the Centers for Disease Control and Prevention (CDC, 2017) reports people in eastern North Carolina have a higher mortality rate compared to people living in urban communities. According to NC Rural Center (2021), there are currently 78 counties in North Carolina that are designated as rural (≤ 250 people per square mile), with 36 of these located in eastern North Carolina. To combat the deeply entrenched health inequities in the United States (US), health professional training programs need pedagogical approaches aimed at training health care providers to competently recognize and address structural factors leading to health inequities. Structural competency is a framework designed to assist providers with identifying and analyzing relationships between structural factors and poor health outcomes, so that structural solutions can be generated (Metzl & Petty, 2017).

Under the guidance of a 7-person expert Advisory Committee and the Structural Competency Working Group (SCWG), an open access structural competency curriculum was adapted to reflect the social and structural barriers of eastern North Carolina and the study multiple Principal Investigators (MPIs) at East Carolina University (ECU) were trained as structural competency trainers. This adapted structural competency training, Health Equity Advanced Through Structural Competency (HEAT-SC), was implemented and took place over

three (3) 1.5-hour sessions between March & April 2021 with health professionals and health-focused faculty at ECU. Prior to the training, participants attended a 2-day Racial Equity Workshop conducted by the Racial Equity Institute (n.d.). This allowed all the participants to begin the HEAT-SC training with the same foundational knowledge and introduced concepts related to structural racism that would be later discussed in the structural competency training. The three structural competency training sessions specifically addressed structural barriers to health and healthcare that are relevant in Eastern North Carolina

The purpose of this project was to: (1) explore the published literature regarding structural competency and how it has been applied in healthcare professional training, and (2) analyze the qualitative data from an educational pilot study implementing an adapted structural competency curriculum completed at ECU for acceptability, appropriateness, and feasibility.

Review of Literature

Search Methods

A review of the literature was done using two electronic databases: PubMed Search and CINHAL Plus with Full Text. The search terms used were “structural competency.” Only articles published since 2014 were included. The rationale for the time frame was significant because structural competency was first introduced by Metzger and Hansen (2014) in their landmark article detailing the concept. Other filters that were applied were English language, study based on humans, and written in the United States. The total number of results yielded was (n = 115): PubMed Search: (n = 66) and CINHAL Plus with Full Text: (n = 49). Four duplicate articles were removed, leaving the remaining articles from these two databases (n=111) for screening. A manual search of the <https://structuralcompetency.org/> website was also completed, yielding one (N=1) article. The initial screening involved a review of the article title and abstract using set of

inclusion and exclusion criteria. The inclusion criteria was: primary research study (quantitative, qualitative, mixed methods), study sample including healthcare professionals and/or students, outcomes focused on structural competency, and conducted in the US. The exclusion criteria was: not a primary research study, reviews of other studies, unsuccessful in retrieving article via inter-library loan was unsuccessful, and not conducted in the US. The initial review yielded a total of ten (N=10) research articles for the full-text review and a Preferred Reporting Items for Systematic Reviews and Meta-analysis flow diagram is presented in Appendix A. The data from the full text were then extracted into a matrix including the following key information: author(s), journal, title, year of publication, study purpose/aims, methods, description of structural competency training/intervention (e.g., duration, format), sample, and key findings.

Search Results

This literature review explored the published literature regarding structural competency and how it has been applied in healthcare professional training and included a total of 10 research studies. The findings are organized into the following categories: timing of the structural competency training in health care training, setting of the structural competency in health care training, types of teaching & learning activities used, measurements of outcomes and the levels of proficiency achieved.

Timing of Structural Competency Training: The majority (n = 9) of the studies were completed with students in healthcare education programs. Three of the studies were in an undergraduate program (Metzl et al., 2018; Metzl & Petty, 2017; Petty et al., 2017), while five were implemented in graduate programs (Avant & Gillepsie, 2019; Mathis et al., 2019; Neff et al., 2016; Woolsey & Narruhn, 2020; Bromage et al., 2018; Andress & Purtill, 2020). One study had

a mix of medical students and healthcare professionals already working in their fields (Neff et al., 2020).

Settings for the Structural Competency Trainings: Most of the studies (n = 9) were completed in a healthcare related educational setting. Three studies were completed at an undergraduate college (Metzl et al., 2018; Metzl & Petty, 2017; Petty et al., 2017) and three studies were at a graduate school (Avant & Gillespie, 2019; Woolsey & Narruhn, 2020; Andress & Purtil, 2020). The graduate schools included: one pharmacy school (Avant & Gillespie, 2019), one Doctor of Nursing Practice (DNP) program (Woolsey & Narruhn, 2020), and one medical school (Andress & Purtil, 2020). Three studies (n = 3) were completed at medical centers with residents enrolled in graduate medical education programs (Bromage et al., 2018; Mathis et al., 2019; Neff et al., 2016). One study took place in a clinical education setting (Neff et al., 2020).

Type of Teaching-Learning Activity: There were a variety of teaching-learning activities used to present the structural competency curriculum. The activities ranged from short training sessions to a semester long course using this curriculum. Three studies presented the curriculum in one lecture-based educational session limited to a couple hours (Woolsey & Narruhn, 2020; Neff et al., 2017, Neff et al., 2020). Another study also presented a lecture-based education session, but it differed in that it included three interactive photovoice sessions (Andress & Purtil, 2020). In four of the studies, the curriculum was presented using a semester long curriculum course (Petty et al., 2017; Metzl et al., 2017; Avant & Gillespie, 2019; Metzl et al., 2018). One study used a seminar-based learning activity (Mathis et al., 2019) that initially introduced structural competency using a didactic component and then moved to applying the concepts through a patient interview. The participants were later brought back to do an activity that sparked discussion on what had been learned and how it was applied into the clinical setting. The remaining study utilized an integrative

learning activity (Bromage et al, 2018). The participants in the study read “*The Social Determinants of Mental Health*” before their first learning session and met at an art gallery to choose art that depicted racial or economic disparities followed by a discussion. The next day the participants were integrated into the community to buy a healthy meal with the average amount a resident in that community could afford. Following these activities, the participants were to present a reflection to their colleagues about the structural determinants that influenced their community (Bromage et al., 2018).

Measurement of Outcomes: Most of the studies (n = 7) measured outcomes using researcher-designed survey tools (Woolsy & Narruhn, 2020; Mathis et al., 2019; Petty et al., 2017; Neff et al., 2017; Neff et al., 2020; Metzl et al., 2018). The goals from the surveys were to determine if the participants demonstrated structural competency following exposure to the curriculum and if the participants felt the teaching had been effective. Many of the surveys also left room for the participants to provide written feedback on how the teaching and activities could be more effective. One study used post-seminar feedback groups to evaluate the learning and effectiveness of the training (Bromage et al., 2018). Another study measured the outcomes through interviews, captions, and reflections from the participants (Andress & Purtil, 2020). The remaining study used short answer exams and weekly reflections from participants to measure the outcomes that related to the proficiency in structural competency (Avant & Gillespie, 2019).

Level of Proficiency Achieved: Four levels of proficiency have been developed by Andress & Purtil (2020) and based on the structural competency analytical framework. These levels include:

- 1st: Knowledge about patient that exceeds the individual body to include an understanding of how social and structural systems -the nine domains- of a place shape population health.

- 2nd: Knowledge of external non-medical resources, practices, or policies in the community that address structural issues from the nine domains that contravene the ability of health care practices to improve well-being.
- 3rd: Able to recognize how “I see” that patient and understand how that characterization (individual stigmatization) may be multiplied in systems to results in societal-level, structural stigmatization.
- 4th: Acts as an informed citizen to undo unsuccessful policies, regulations, structures, and systems that influence the population health of groups in a place.

The levels of this evaluation were based on the level where a majority of the participants achieved, although there were outliers in the sample that achieved a higher level or a lower level. Using this criterion, participants in five of the studies (Andress & Purtill, 2020; Avant & Gillepsie, 2019; Woolsey & Narruhn, 2020; Neff et al., 2017; Neff et al., 2020) achieved level 1 proficiency. The participants in the study were able to achieve a better understanding of structural competency, but it was not apparent that the participants were aware of specific ways in which address the structural issues. The second level of proficiency was achieved by participants in three of the studies (Petty et al., 2017; Metzl & Petty, 2017; Metzl et al., 2018). The third level of proficiency was achieved by participants in two studies (Bromage et al., 2018; Mathis et al., 2019). In these studies, most of the participants immersed themselves in the patient situations to recognize the impact they made as a provider. None of the study participants proceeded past level three to make it to a level four proficiency.

Discussion of Literature Review Findings

Structural competency is still a very new concept and there are a variety of different ways that this curriculum has been implemented in healthcare professional training. As previously

mentioned, every aspect of these studies was unique in a way that makes it hard to evaluate and compare them. The participants ranged from students aspiring to join the health care field to active healthcare providers currently working in the clinical setting. The presentation of this curriculum was also very different throughout each one of the studies. The longevity of these studies also ranged from short studies with only a few hours of training to an entire program curriculum encompassing structural competency. Without a standardized presentation of the curriculum, it is very difficult to thoroughly assess and compare the study outcomes. Another aspect that contributes to these difficulties is the lack of a standardized evaluation tool. While many of the studies used a researcher-developed survey to evaluate if the learning was effective from the participant perspective and the survey questions varied significantly. A generalized curriculum and evaluation tool would allow for a better comparison and a proper grasp on what aspects of these studies were adequate and what was overall unsuccessful.

That being said, the literature in this review provides preliminary evidence of the effectiveness of structural competency training in increasing the levels of proficiency of health care professionals and health care professional students to recognize and overcome barriers that contribute to not only healthcare inequities, but also ones that may appear outside the clinical setting. One overall goal for these curricula is to reach the highest level of proficiency, which is level four. This proficiency is achieved by participants only if they can act with their positions to eliminate the structural inequities that provide a barrier in receiving the best care possible (Andress & Purtill, 2020). Although the structural competency curriculum varied significantly, these preliminary outcomes supported that most of the training was presented in effective ways to achieve the at least basic level of proficiency in structural competency.

Study Purpose

As the literature review revealed, structural competency training is a new and understudied subject. So, the HEAT-SC team embarked on a 12-month process of adapting and implementing the structural competency curriculum with an interprofessional group of health-related faculty and staff at ECU in the Spring of 2020. After implementation, the team collected both quantitative and qualitative data to assess the acceptability, appropriateness, and feasibility of this adapted curriculum. One goal of this Signature Honors Project was to answer the following research question:

Is the adapted structural competency curriculum acceptable, appropriate, and feasible for training healthcare professionals in eastern North Carolina?

Data Collection

The HEAT-SC pilot educational study yielded both qualitative and quantitative data about acceptability, appropriateness, and feasibility of the adapted structural competency curriculum. For this Signature Honors Project, only the qualitative data collected following the HEAT-SC training was analyzed for acceptability, appropriateness, and feasibility of the structural competency training. The qualitative data included a transcript of the debriefing focus group conducted and recorded via Microsoft (MS) Teams platform, written responses in the MS Teams chat, and written responses to a set of short answer questions from the pilot participants; each of which explored the acceptability, appropriateness, and feasibility of the training. The debriefing focus group was guided by a semi-structured interview guide and conducted by the pilot study MPIs, Drs. Black, Corral and Caiola.

Ethics

The Collaborative Institutional Training Initiative (CITI) modules were completed by the author and an Institutional Review Board (UMCIRB 20-001625) amendment was submitted by the MPIs and approved by UMCIRB in order for the author to obtain access to the study data.

Data Management & Analysis

The virtual debriefing focus group was recorded. The recording was transcribed verbatim and verified for accuracy by the pilot study MPIs. The debriefing focus group chat responses/comments in the chat box and the short answer written responses were all collated and de-identified. After getting approval by the Institution Review Board (IRB), the qualitative data were accessed through a secure database called Piratedrive. The qualitative data was analyzed using a directed content analysis approach (Hsieh & Shannon, 2005). This was the best approach to use due to the limited amount of research and study implementations currently available on structural competency (Hsieh & Shannon, 2005). To begin, the data were reviewed and a summary and reflections on the transcript content was completed. The coding schema was developed using the implementation outcomes tool provided by prior research findings on acceptability, appropriateness, and feasibility (Weiner et al, 2017).

The data were separately hand coded by the writer and the Honors Project mentor using the codes from the codebook. After the data was individually coded both reviewers', the team met to review the results, discuss any discrepancies in coding and come to consensus on the overall findings related to acceptability, appropriateness, and feasibility.

Results

Sample

Study participants for the HEAT-SC project included health-focused faculty or professionals from the ECU College of Nursing, Brody School of Medicine, College of Allied Health Sciences, School of Dental Medicine, School of Social Work, Department of Human Development and Family Science, Department of Public Health, and Department of Health Education and Promotion. The study inclusion criteria were providers or faculty in the previously mentioned colleges, committed to attending all three structural competency training sessions and the 2-day Racial Equity Workshop. Fifteen participants were initially recruited; however, attrition of two participants occurred over the pilot study implementation period resulting in a total of 13 participants. Out of 13 participants, 5 identified as White (38%), 4 identified as Black or African American (31%), 1 as Asian or Asian American (8%), 0 as Hispanic/Latina/Latinx (0%), 0 as Native/Alaskan American (0%) and 3 were missing (23%). For gender identity, 8 identified as Cisgender women (62%), 1 as a Cisgender man (8%), 1 as Prefer not to answer (8%) and 3 were missing (23%). For Title at ECU, 1 identified as OB/GYN Residency Program Manager (8%), 2 identified as Associate Professor (15%), 3 identified as Assistant Professor (23%), 1 identified as a Professor (8%), 1 identified as an Nurse Practitioner (8%), 1 identified as a Graduate Studies Director (8%), and 3 were missing (23%). The length of time living in NC ranged from 7.5 years to 46 years with the average length of time being 25 years among the 10 participants that responded.

Qualitative Results

Embedded in the participants' discussion of their experiences participating in the HEAT-SC pilot study were descriptions of how they found the curriculum acceptable, appropriate, and

feasible. Participants spoke about their experiences with ease, often chimed in the conversation using the chat feature in MS Teams, wrote descriptive answers to the written questions and offered suggestions for how to make the training better.

Acceptability was defined as, “Perception among implementation stakeholders that a given treatment, service, practice, or innovation is agreeable, palatable, or satisfactory.” (Weiner et al., 2017, p. 2). One participant spoke to the acceptability of the curriculum by saying, “*Yes, I think the content of the training is very rich and therefore, can be adopted to a programs curriculum.*” [Participant 11]. Another participant stated, “*The entire program starting with the REI training was phenomenal! It was a lot of information to learn but eye opening.*” [Participant 9].

Appropriateness was defined as, “The perceived fit, relevance, or compatibility of the innovation or evidence-based practice for a given practice setting, provider, or consumer; and/or perceived fit of the innovation to address a particular issue or problem (Weiner et al., 2017, p. 2). A response from one participant for acceptability was, “*All providers would definitely benefit. The training will help people from all backgrounds better understand how they can better help patients who are different from them.*” [Participant 9]. Another participant contributed to the acceptability with the following statement, “*I believe this re-learning is a crucial first step in beginning to examine their own biases and the impact those biases can have of the quality of care they provide if they aren't acknowledged and addressed.*” [Participant 8].

Feasibility was defined as, “The extent to which a new treatment, or an innovation, can be successfully used or carried out within a given agency or setting (Weiner et al., 2017, p. 2). Two exemplar statements that support the feasibility of the study with simple revisions were “*I don't think that there is any change in the substantive content needed. But I suspect that the*

program would need to be condensed to fit into their schedules.” [Participant 10] and “I think this program would be even more beneficial as a face-to-face training.” [Participant 1].

Discussion

The purpose of this research was to (1) gain a further insight into the concept of structural competency through a review of literature and (2) complete a data analysis of the adapted structural competency pilot study performed at ECU focusing on the acceptability, appropriateness, and feasibility.

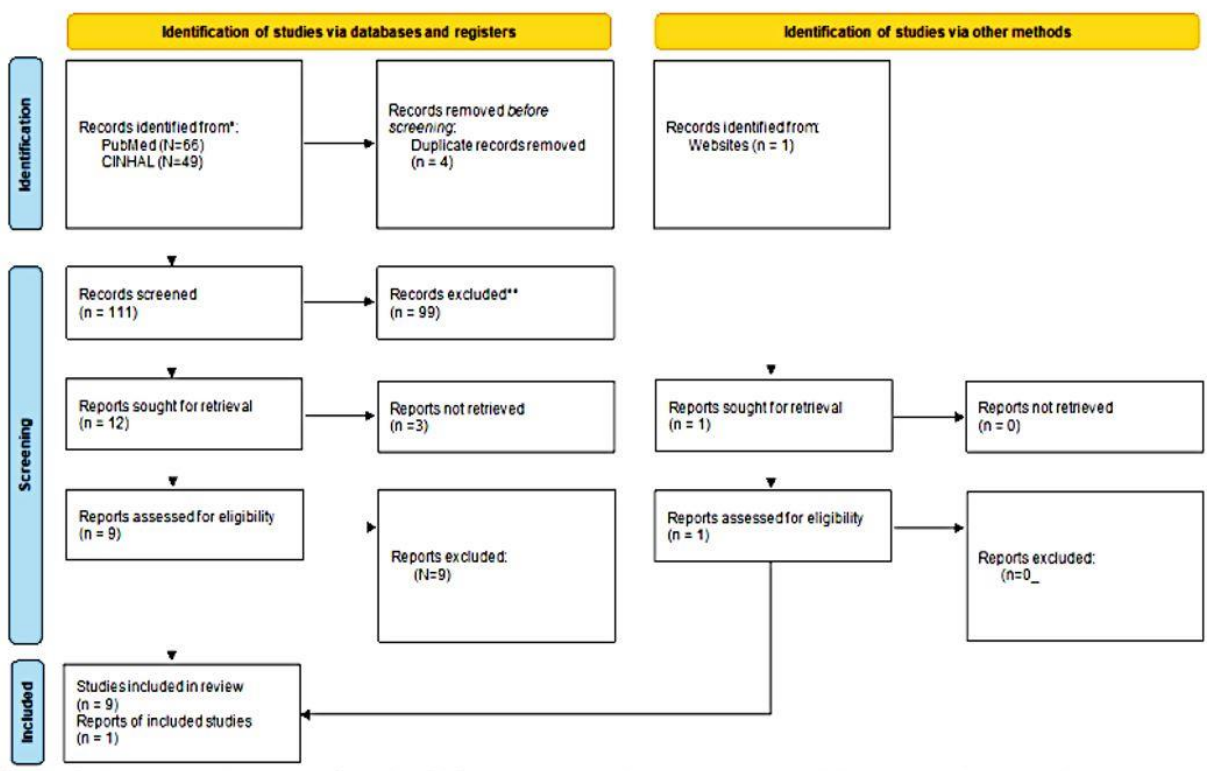
Our results support that the adapted HEAT-SC curriculum is acceptable, appropriate, and feasible with the caveat of some suggested revisions for feasibility in the ECU/Eastern North Carolina context. Suggestions from the qualitative data included: providing more discussion time, having the teachings in person, and changing the context to fit a variety of disciplines. The suggested revisions were all related to implementation of the curriculum and not content based. The limitations to the study were: small sample size and preliminary data. Overall, the preliminary findings suggest the adapted curriculum can be implemented on a larger scale with interprofessional health science students, faculty, and staff at ECU.

Conclusion

Overall, based on the literature review and preliminary study results, there is a clear need for structural competency training to address structural barriers in health and healthcare. The qualitative results of the pilot study support the adapted structural competency as being acceptable, appropriate, and feasible. The structural competency curriculum offers a promising pedagogical approach to training health care providers to competently recognize and address structural factors leading to health inequities. Poor outcomes continue to occur across populations and there is not enough being done. These outcomes are widely recognized, but

ways to create and facilitate change are not. The next steps of this study team include publishing a revised literature review based on structural competency and taking steps to implement the curriculum on a larger scale at East Carolina University in eastern North Carolina.

Appendix A



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

References

Achieving health equity. RWJF. (2021, October 29).

<http://www.rwjf.org/en/library/features/achieving-health-equity.html>.

Andress, L., & Purtill, M. P. (2020). Shifting the gaze of the physician from the body to the body in a place: A qualitative analysis of a community-based photovoice approach to teaching place-health concepts to medical students. *PLOS ONE*, *15*(2).

<https://doi.org/10.1371/journal.pone.0228640>

Avant, N. D., & Gillespie, G. L. (2019). Pushing for health equity through structural competency and implicit bias education: A qualitative evaluation of a racial/ethnic health disparities elective course for pharmacy learners. *Currents in Pharmacy Teaching and Learning*, *11*(4), 382–393. <https://doi.org/10.1016/j.cptl.2019.01.013>

Bromage, B., Encandela, J. A., Cranford, M., Diaz, E., Williamson, B., Spell, V. T., & Rohrbaugh, R. M. (2018). Understanding Health Disparities Through the Eyes of Community Members: A Structural Competency Education Intervention. *Academic Psychiatry*, *43*(2), 244–247. <https://doi.org/10.1007/s40596-018-0937-z>

Centers for Disease Control and Prevention. (2017, November 27). *Racial/Ethnic Health Disparities Among Rural Adults - United States, 2012–2015*. Centers for Disease Control and Prevention.

https://www.cdc.gov/mmwr/volumes/66/ss/ss6623a1.htm?s_cid=ss6623a1_e

Centers for Disease Control and Prevention. (2021, March 17) *North Carolina Key Health Indicators*. Centers for Disease Control and Prevention.

<https://www.cdc.gov/nchs/pressroom/states/northcarolina/nc.htm>

- Centers for Disease Control and Prevention. (2021, April 19) *Health Equity Considerations & Racial & Ethnic Minority Groups*. Centers for Disease Control and Prevention.
<https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/race-ethnicity.html>
- Hansen, H., & Metzl, J. (2016). Structural Competency in the U.S. Healthcare Crisis: Putting Social and Policy Interventions into Clinical Practice. *Journal of Bioethical Inquiry*, 13(2), 179–183. <https://doi.org/10.1007/s11673-016-9719-z>
- Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288.
<https://doi.org/10.1177/1049732305276687>
- Mathis, W., Cyrus, K., Jordan, A., & Rohrbaugh, R. (2019). Introducing a Structural Competency Framework for Psychiatry Residents: Drawing Your Neighborhood. *Academic Psychiatry*, 43(6), 635–638. <https://doi.org/10.1007/s40596-019-01077-z>
- Metzl, J., & Hansen, H. (2014). Structural competency: Theorizing a new medical engagement with stigma and inequality. *Social Science & Medicine*, 103, 126-133.
<https://pubmed.ncbi.nlm.nih.gov/24507917/>
- Metzl, J. M., & Petty, J. L. (2017). Integrating and Assessing Structural Competency in an Innovative Prehealth Curriculum at Vanderbilt University. *Academic Medicine*, 92(3), 354–359. <https://doi.org/10.1097/acm.0000000000001477>
- Metzl, J. M., Petty, J. L., & Olowojoba, O. V. (2018). Using a structural competency framework to teach structural racism in pre-health education. *Social Science & Medicine*, 199, 189–201. <https://doi.org/10.1016/j.socscimed.2017.06.029>

- Petty, J. L., Metzl, J. M., & Keeys, M. R. (2017). Developing and Evaluating an Innovative Structural Competency Curriculum for Pre-Health Students. *Journal of Medical Humanities*, 38(4), 459–471. <https://doi.org/10.1007/s10912-017-9449-1>
- Neff, J., Holmes, S. M., Knight, K. R., Strong, S., Thompson-Lastad, A., McGuinness, C., Duncan, L., Saxena, N., Harvey, M. J., Langford, A., Carey-Simms, K. L., Minahan, S. N., Satterwhite, S., Ruppel, C., Lee, S., Walkover, L., De Avila, J., Lewis, B., Matthews, J., & Nelson, N. (2020). Structural Competency: Curriculum for Medical Students, Residents, and Interprofessional Teams on the Structural Factors That Produce Health Disparities. *MedEdPORTAL*, 16(1). https://doi.org/10.15766/mep_2374-8265.10888
- Neff, J., Knight, K. R., Satterwhite, S., Nelson, N., Matthews, J., & Holmes, S. M. (2016). Teaching Structure: A Qualitative Evaluation of a Structural Competency Training for Resident Physicians. *Journal of General Internal Medicine*, 32(4), 430–433. <https://doi.org/10.1007/s11606-016-3924-7>
- NC Rural Center. (2021, March 30). *Rural North Carolina at a Glance*. <https://www.ncruralcenter.org/2021/03/rural-north-carolina-at-a-glance/>
- Racial Equity Institute. (n.d.). <https://www.racialequityinstitute.com/>.
- Sandelowski, M. (1995). Qualitative analysis: What it is and how to begin. *Research in Nursing & Health*, 18(4), 371–375. <https://doi.org/10.1002/nur.4770180411>
- Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., ... Weeks, L. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of internal medicine*, 169(7), 467-473. <https://doi.org/10.7326/M18-0850>

- Weiner, B. J., Lewis, C. C., Stanick, C., Powell, B. J., Dorsey, C. N., Clary, A. S., ... Halko, H. (2017). Psychometric assessment of three newly developed implementation outcome measures. *Implementation Science, 12*(1):108. <https://doi.org/10.1186/s13012-017-0635-3>
- Willing, C., Gunderson, L., Shattuck, D., Sturm, R., Lawyer, A., & Crandall, C. (2019). Structural competency in emergency medicine services for transgender and gender non-conforming patients. *Social Science & Medicine, 222*, 67–75. <https://doi.org/10.1016/j.socscimed.2018.12.031>
- Woolsey, C., & Narruhn, R. (2020). Structural competency: A pilot study. *Public Health Nursing, 37*(4), 602–613. <https://doi.org/10.1111/phn.12756>
- 2021 NC Rural Health Snapshot. Foundation for Health Leadership Innovation RSS. (n.d.). <https://foundationhli.org/2021-nc-rural-health-snapshot/>.