# Pushing Social Determinants of Health Further: An Application of Structural Competency to Food Insecurity in Graduate Medical Education

By

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Thesis

Submitted to the Faculty of the

Graduate School of Vanderbilt University

in partial fulfillment of the requirements

for the degree of

MASTER OF ARTS

in

Medicine, Health, and Society

May 14, 2021

Nashville, Tennessee

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To my dad,

For teaching me that

Hard work pays off.

ACKNOWLEDGMENTS

I am forever grateful for the lessons I learned, the hardships I weathered, and the moments I celebrated at Vanderbilt. This place will always be home. But most importantly, it is the people who make it the place. The list of people who supported me during my journey of completing this thesis research is a hearty one. First, I owe deep gratitude to my advisor Dr. JuLeigh Petty who believed in me from the very beginning. Her unwavering mentorship and contagious passion for her work made this project possible. Next, I want to sincerely thank Dr. Danielle Picard for teaching me the power of chasing curiosity, leaning into uncertainty, and celebrating the small victories. I also want to thank Dr. Laura Stark for her generous wisdom throughout my academic journey. She encouraged me to ask the hard questions - a lesson that will stick with me as I continue to grow as a student. I want to express gratitude to all of the folks at The Nashville Food Project, whose passion for bringing food justice to the community motivated my pursuit of this project.

I want to thank Olivia Post for her endless support as my roommate, classmate, and confidant. Thanks to the pandemic, our apartment became our classroom and I would not have wanted to go through this tumultuous year without anyone else by my side. I want to thank Witt Fesmire, Ryan Hale, and Katie Phillips, whose friendship and support created the community I needed. I also want to give special thanks Puja Jagasia. Her love and patience kept me going.

It is hard to put into words the gratitude I feel for my sisters, Sami and Elly Gross, and my parents, Nancy and David Gross. From family dinners on Facetime to thesis defense rehearsals and everything in between, my family has surrounded me with the love and support I needed this year. They have taught me to make self-belief my rock. I am excited to bring this year's growth into the journey ahead.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

# LIST OF ABBREVIATIONS

| | |
|---|---|
| AMA | American Medical Association |
| MA/MS | Master of Arts/Master of Science |
| MHS | Medicine, Health, and Society |
| SDOH | Social Determinants of Health |
| SNAP | Supplemental Nutrition Assistance Program |

# INTRODUCTION

Ms. Smith is a 57-year-old Black, single mother to three children. She lives with her daughter, who is a single mother to three teenage children. Neither are able to afford rent on their own. After experiencing bouts of dizziness, nausea, and loss of circulation, Ms. Smith visited a free health clinic and was diagnosed with diabetes. The physician prescribed Ms. Smith Metformin once a day and suggested limiting her daily caloric intake to 1500 calories. The physician recommended eating a full serving of fruits and vegetables daily and limiting fats and sugars. How can the physician appropriately treat Ms. Smith given the context of her life as an uninsured or underinsured Black single mother who is experiencing housing insecurity and food insecurity?

Discourse about the ways in which social and structural environments influence health has long been recognized in the social sciences and has recently gained traction in clinical medicine. While the inclusion of sociopolitical factors in clinical medicine is a positive step toward addressing the root causes of diseases, there does not exist a common language to discuss and intervene on such factors. The two dominant approaches used in clinical medicine are social determinants of health (SDOH) and structural competency. Social determinants of health as an educational framework has been included in graduate medical education in recent years as a way of teaching medical professionals about how the social environment shapes health outcomes. Even more recently, the structural competency framework has been proposed as a way to train clinicians to address the *structural* determinants of health. According to Metzl and Hansen, structural competency is the ability to understand how upstream, structural decisions about healthcare delivery, food access, zoning laws and neighborhood design, and urban and rural infrastructures can affect downstream representations of illness, like symptoms, diseases, and

attitudes (2014). Structural competency can be employed in the medical profession as a training tool for healthcare providers to address structural factors, like food insecurity, that manifest in clinical diagnoses, such as obesity or diabetes. The line between SDOH and structural competency is unclear or perhaps non-existent. This thesis aims to make a distinction.

In this paper, structural factors are labeled as distal, while individual factors, like behaviors and choices related to health outcomes, are labeled as proximal (Link and Phelan, 1995). Often, health interventions operate on the proximal level and fail to acknowledge the influence that distal factors have on health outcomes. Food insecurity as a healthcare issue stands at the intersection between proximal and distal interventions; while it has historically been addressed on an individual level in diabetes and obesity contexts as behavioral changes and diet choices (Jack et. al, 2012), there is a growing shift in clinical interventions towards addressing food access on a structural level. (Whittle et. al, 2015). Food insecurity demonstrates the need for healthcare professionals to understand and address structural issues in clinical settings.

Structural factors are defined as systems like medicine, law, or welfare that create differential access to social, political, and economic resources and produce group-differentiated vulnerabilities to harm (Link and Phelan, 1995). Social factors include socioeconomic status, age, sex, housing, transportation, accessibility of healthcare resources, and access to healthy and affordable food (Jack et al., 2012, p. 10). The line between the "social determinants of health" and "structural competency" approaches to addressing health disparities is blurred. The characteristics of social and structural factors do not have clear boundaries. Because of this, there does not exist a unified language in clinical medicine or the social sciences.

The terms "social" and "structural" are commonly used to describe the environment beyond the clinic that influences health. This study seeks to distinguish between the two terms as

they are used in the "social determinants of health" and "structural competency" frameworks. This study proposes structural competency as a term to unite the effort to effectively address the distal causes of health outcomes. The primary objective of this study is to explore how graduate medical education approaches the social environment's influence on health and to expose the gap in the literature between how "social" and "structural" factors are defined. This exploration uses food insecurity as a case study to demonstrate the need for structural competency as a unifying term.

The American Medical Association Reimagining Residency grant program sponsored Vanderbilt's Department of Medicine, Health, and Society to create learning modules (recorded mini-lectures) and a casebook for resident physicians to be trained in structural competency approaches to healthcare interventions. This study analyzes the design of an online vignette and assessment that tests participant's ability to identify food insecurity as a structural issue and apply structural competency to a problem. The vignette is designed to be included in a comprehensive structural competency learning module for the AMA Reimagining Residency grant program. By developing a structural competency training tool, this project works to deepen the understanding of the ways in which patients' health is impacted beyond the walls of the clinic.

## LITERATURE REVIEW

The blurred line between factors defined as 'social' in the SDOH framework and 'structural' in the structural competency framework causes inconsistencies in medical interventions and educational frameworks. This review of the literature seeks to illuminate the answers to the following questions: What is the difference between "social determinants of

health" and "structural competency" in terms of the healthcare issues they address? How can structural competency push SDOH in medical education further toward addressing more distal determinants of health? This study will use the literature to answer the above questions in order to contextualize and motivate the need for a structural competency module that includes an online food insecurity vignette.

While the terms social and structural are sometimes used interchangeably, Neff et al. (2020) lays out the key differences. Social determinants of health addresses how poverty and inequality contribute to health disparities. Structural competency zooms out to address the structures, like policies, economic systems, and social hierarchies (racism, sexism, ableism, and so on) that produce and maintain the social determinants of health (Neff et al., 2020, p. 2). Neff et al. argue that structural competency builds upon the existing framework of social determinants of health by contextualizing the social factors within the broader structural drivers of health disparities (2020, p. 2).

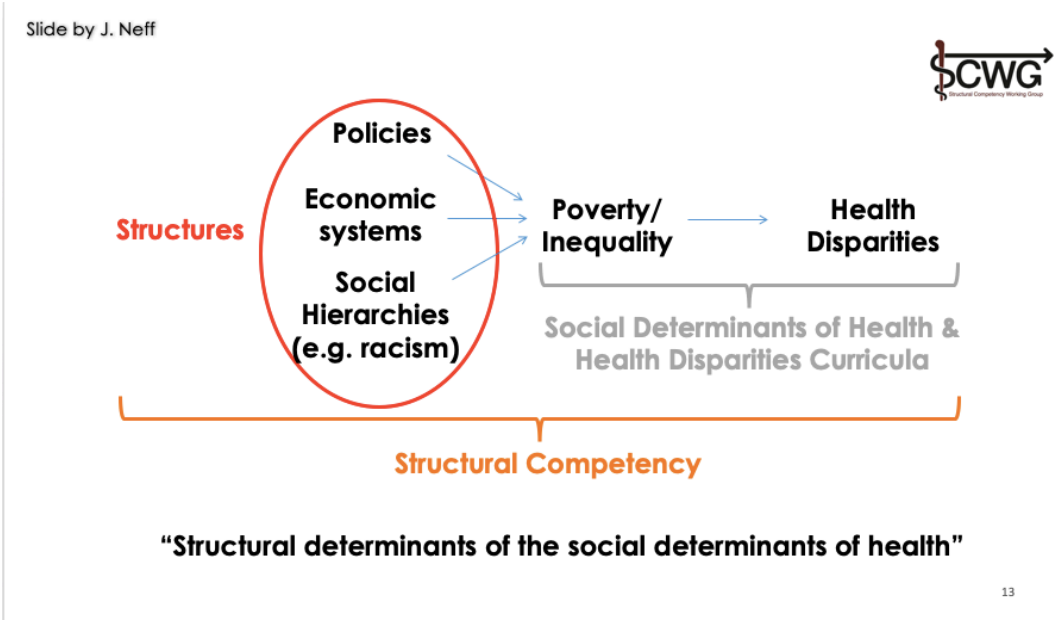



Figure 1
*Structural Determinants of the Social Determinants of Health Diagram* (Neff et al., 2020, Training Slides Module 2)

The tension between these two terms lies in the misalignment between the structural issues that contribute to health disparities and the actual recommendations and interventions implemented. While the social determinants of health approach can address structural issues, it often informs interventions on the individual/proximal level. Meanwhile, structural competency emphasizes the importance of addressing disparities in health outcomes by intervening on the structural/distal level. Food insecurity, as a case study, demonstrates the tension between the two terms. Clinical interventions that are based on "social determinants of health" address food insecurity on a spectrum from proximal to distal levels.

Food insecurity, defined as "the limited or uncertain availability of nutritionally adequate, safe foods, or the inability to acquire personally acceptable foods in socially acceptable ways" (Anema et al., 2009, p. 2), is rooted in social and structural barriers. However, nutrition interventions do not always acknowledge the social and structural barriers to food. An individual-based nutrition intervention demonstrates this conflict. As argued in a paper written by health education scholars, medical sociologists, and public health nutritionists, doctors are deemed a key player in addressing nutrition in the clinic because patients have regular contact with their doctors. Doctors are often the first to hear about lifestyles and concerns from patients and doctors have authority to make nutrition recommendations that significantly impact health outcomes. The authors argue that doctors should play a role in fixing poor nutrition because "improved dietary and nutrition behavior may help reduce the occurrence of noncommunicable diseases" (Mogre et al., 2019, p. 91). An important shortcoming of this piece is the absence of conversation about the social and structural factors that contribute to poor nutrition in the first place, such as food insecurity caused by inequitable access to affordable, healthy foods. This shortcoming is not an anomaly in the literature about nutrition's role in chronic disease.

However, when food insecurity is included as a contributing factor to nutrition-related diseases, both SDOH and structural competency frameworks are implemented. A study in the San Francisco Bay area surveyed people who have HIV-positive diagnoses and are facing food insecurity and discovered three major themes relating to lived experiences with food insecurity: insufficient quantity of food, poor quality of food, and dangerous or socially unacceptable strategies for procuring food (Whittle et al., 2015, p. 156). This study argues that the inequitable distribution of food insecurity is a form of structural violence, a term defined as "a construct that has been used to demonstrate the way in which the political and economic organization of society can invisibly and systematically foster physical harm and emotional distress among groups of vulnerable individuals" (Whittle et al., 2015, p. 155). This argument motivates the need for structural interventions at a policy level, such as gentrification and housing policy and also disability policy that manifests in SNAP eligibility criteria. While this study highlights the importance of recognizing food insecurity as a structural issue, not all definitions of food insecurity categorize the issue as "structural".

In a study about diabetes-related health disparities, public health scholars define food insecurity as a *social* determinant of health because inaccessibility of supermarkets with healthy food, overabundance of fast food restaurants, and redlining disproportionately affects low-income, racial minority communities. After arguing for the need for health professionals to understand the relation between social determinants of health (i.e. food insecurity) and health outcomes (i.e. diabetes), the authors describe vertical, interdisciplinary public policies as institutional improvements that could improve health, like transportation, housing, safety, and land use (Jack et al., 2012, p. 11). Healthcare providers are encouraged to advocate for policy change, a recommendation that resembles structural determinants of health. However, the

authors name it “social determinants.” This SDOH approach includes policy as a mode through which healthcare providers can intervene. Health interventions that address food insecurity demonstrate the convoluted nature of the terms “social” and “structural” when addressing determinants of health.

## Social Determinants of Health Falls Short

The consensus in the literature lands on a definition of social determinants of health that acknowledges that health disparities exist as products of the social environment, but fails to acknowledge the structures in place that produce and maintain inequality in the social environment, like systemic racism and structural violence. Riley et al. define the following five key components that comprise the social determinants of health: “economic stability, education, health and healthcare, neighborhood and built environment, and social and community contexts” (Riley et al., 2020, p. 241). While the SDOH framework can be defined in a way that resembles structural competency, it does not consistently acknowledge the structures at play that create and maintain social issues and health disparities. Thus, a key component of social determinants of health is the range of levels on which this approach can intervene.

### *The Disconnect in SDOH Interventions*

Clinical interventions address the social determinants of health on a spectrum from the proximal level to the distal level. While the intent for many interventions is to address the underlying social determinants of health, there is a disconnect between the definition of the social factors and the implementation of the interventions that address such factors.

Dialogue about diabetes treatment often places responsibility on the individual to make dietary and lifestyle changes. Public health scholars who study diabetes-related health disparities discuss the problematic, patient-blaming nature of the dominant paradigm used to address

diabetes prevention and treatment, which includes a belief that individuals are responsible for maintaining healthy lifestyles (Jack et al., 2012). Individualized approaches to diabetes care that are labeled as SDOH include behavior changes and diabetes self-management education, but studies that prove this to be effective are highly controlled and isolated in clinical settings so the results are short-term. These studies fail to acknowledge the role of physical and social environmental factors, such as neighborhood design, public policy, zoning regulations, segregation, and access to resources, all of which are root causes of health disparities and poor health outcomes (Jack et al., 2012, p. 9). Interventions that address the patient's needs on an individual level fail to acknowledge the structures at play that brought them into the clinic in the first place.

Some SDOH interventions do focus on distal determinants and thus the intent and outcomes of the interventions are aligned. An online learning module used in a nursing school to teach students about food insecurity as a social determinant of health demonstrates the ways in which the SDOH approach can include interventions on a distal level. Riley et al. argue that a key aspect of social determinants of health education is screening for food insecurity in clinical encounters. Because of many barriers to effective screening, including patient trust, stigma and privacy concerns, and difficulties navigating government assistance benefit applications, the complexity of food insecurity as a structural issue should be included in nursing education curricula (Riley et al., 2020, p. 242). Riley et al.'s study implemented a continuous improvement process for the creation and implementation of the food insecurity SDOH module, which includes a call for an interdisciplinary, inter-professional approach to curriculum design and clinical implementation (2020 p. 242). Riley et al.'s case study exemplifies how SDOH can cover the structural barriers to food security.

Structural barriers affect food insecurity for a wide range of populations, including geriatric patients. Food insecurity among elderly Americans is continuing to rise as the population of older adults grows. SNAP, the Supplemental Nutrition Assistance Program, can reduce avoidable healthcare utilization, which includes nursing home stays, hospitalizations, and emergency department visits. Also, SNAP is associated with reduced medication non-adherence due to cost in food-insecure older adults, but under-enrollment in SNAP in the elderly population reveals barriers to enrolling (Pooler et al., 2018, p. 421). Some of these barriers may include access to a computer and/or internet, transportation to enrollment offices, and knowledge gaps in enrollment requirements. Because many geriatric patients interact with clinicians regularly, providers can make a significant impact on their patient's clinical care by discussing food access. The authors argue that clinicians can address food insecurity by screening patients to catch food insecurity that may otherwise go unnoticed, intervene clinically by referring patients to nutrition assistance programs, and using their unique power to advocate for policies and programs (2018, p. 422). The interdisciplinary nature of this study's research team, which includes scholars of public policy, public health, law, geriatric medicine, and internal medicine demonstrates how widely the term "social determinants of health" is used across disciplines. While the intervention proposed includes addressing structural barriers to food and SNAP enrollment, this study names food insecurity as a social determinant of health for older adults. Because SDOH can also include structural determinants, the line between social and structural determinants is not concrete or consistent.

**Structural Competency as a Unifying Term**

Structural competency as an approach for physician training is grounded in five core structural competencies: "1) recognizing the structures that shape clinical interactions; 2)

developing an extra-clinical language of structure; 3) rearticulating "cultural" formulations in structural terms; 4) observing and imagining structural interventions; and 5) developing structural humility" (Metzl and Hansen, 2014, p. 1). A key component of structural competency, as described in the third competency, is its emphasis on a shift away from cultural competency.

Structural competency moves beyond cultural competency, which is a training method commonly used to teach medical providers about cultural differences and patterns they might encounter with their patients. Cultural competency approaches can reinforce racial, ethnic, religious, or other stereotypes (Downey and Gomez, 2018, p. 212). Structural competency in clinical training shifts the gaze away from individual, "cultural" responsibility, like food choice, towards the ways in which health outcomes are impacted by the organization of institutions and policies, like food access.

Imagine an interaction between a physician and a patient who experiences obesity. A structurally competent provider would be trained to ask questions about how the patient accesses healthy foods instead of placing responsibility for food choices on the individual. The physician would have the tools to analyze the resources, institutions, and policy decisions that impact the diet and health outcomes of this patient and propose a structural intervention to treat this patient, like connecting them to federal assistance meal programs or local food banks. Structural competency shifts the attention toward the structures at play that cause barriers to accessing and defining healthy foods, such as neighborhood design and access to transportation.

Structural competency equips healthcare providers with the tools to address structural violence. Whittle et al. argue that institutions, policy-level decisions, and social practices are key agents of structural violence (2015). Thus, the structural issue of food access, which can be traced to gentrification, must be addressed with structural interventions, like controlling rent

prices with policy change, funding food assistance organizations, and offering housing support for vulnerable individuals. Structural violence manifests in health disparities and should be addressed through structural interventions, like structural competency in the medical field.

Unlike the SDOH approach, structural competency includes structures of privileges, including wealth and whiteness, that shape health outcomes. Metzl et al. argue that structural competency is a way to train physicians to diagnose and treat the effects of implicit biases embedded in the United States healthcare system that perpetuate racial health disparities (2018, p. 1). Structures of race in the U.S. shape health outcomes of privileged groups, as represented by an assumption that mental illness, specifically depression, predominantly affects white, high-SES, women. In a study by Metzl et al., undergraduate students were prompted to write a response about a pharmaceutical advertisement for an anti-depressant that depicted a woman who appeared white holding a baby saying "I got my playfulness back!" The results from the study showed that students had difficulty recognizing privilege and whiteness as a structure that impacts health outcomes (Metzl et al. 2018, p. 11). These results point to the need for a shift in education toward understanding privilege as well as marginalization in the context of structural factors.

*Structural Competency Interventions*

Structural competency creates a framework for healthcare providers to address the structural contexts in which their patients live. Structural competency in clinical medicine serves as a framework for implementing interventions that address the patient at the most distal level. Metzl and Hansen's fourth competency, which reads "observing and imagining structural interventions" (Metzl and Hansen, 2014, p. 10), is critical for addressing food insecurity as a structural issue in the real world. Engaging structural competency trainees in social justice-

oriented work will guide them toward effectively intervening on structural issues. Metzl and Hansen discuss a structural intervention for addressing food insecurity in which Dr. Gieger, an activist physician, wrote prescriptions for healthy foods that patients could "fill" at local grocery stores, which his community health center paid for. This is one example of a way to address food insecurity that considers the structures that shape the patient's life (2014, p. 10-11).

Other examples of structurally competent interventions that address food insecurity include a family medicine clinic that implemented food insecurity screening. The medical approach to food insecurity adds value to the larger conversation about food insecurity and health outcomes because providers have a first-hand view of chronic health conditions that result from food insecurity. This study gauged patient attitudes about screening for food insecurity in a Family Medicine clinic by distributing voluntary surveys in both a university-based clinic and two community-based clinics. The study showed that screening for food insecurity was valuable in a primary care setting and that the most popular intervention preference by patients was to provide resources for connecting patients to food banks, local organizations, and financial assistance programs (Kopparapu et al., 2020, p. 204). The results from this study are aligned with a structural competency framework for food insecurity interventions. This intervention shifts the responsibility away from individual behavior and towards the local and federal resources available for patients to access food. Because this study acknowledges food insecurity as a risk for chronic health conditions and food access as a major barrier to good health, Metzl and Hansen's research would categorize it as a structural competency approach to addressing food insecurity in the clinic.

The previous study points to Family Medicine as a sector that can play a key role in bringing structural competency into the clinic. Similarly, an interdisciplinary research team in

California analyzed the design, implementation, and evaluation of a structural competency training program in a Family Medicine residency program, which consisted of a 3-hour session with 3 modules (Neff et al., 2017). The key question this article seeks to address is "How effective is a training program that is designed to help medical residents respond to the downstream effects (diseases and symptoms) of sociopolitical structures?" (2017, p. 430) Medical residents saw improvement in their awareness about structural influences on health and thus their relationships with patients were improved. They also found a need for further training in addressing the structural influences extra-clinically, as resident physicians felt overwhelmed after learning about structural inequalities and not knowing how to effectively address them. Because structural competency had a positive impact on the residents' perspectives, student doctors reported to be more likely to address health disparities in their delivery of care, particularly for structurally vulnerable patients (2017, p. 432). Structural competency is built upon the foundation that patients' lives are shaped by structures. Providers must understand the structural determinants at the root of health disparities in order to most effectively address them. Structural competency training does just that; it trains providers to understand disparities in health outcomes and implement their knowledge of the structures that maintain such disparities in order to create the most effective treatment plan.

Structural competency seeks to train physicians about how structural issues, like structural racism, structural violence, and discrimination impact health; however, while structural forces are becoming more widely recognized as influencers on health outcomes, Neff et al. argue that the relationships between structures and healthcare is not uniformly taught in medical education (2017, p. 430). The execution of the training and implementation of structural competency may face barriers. Even though the intention of a "Family Values" course in a

medical school curriculum was to train student doctors about inequality, a study found that medical students disengaged and resisted discussing topics related to social issues in this course. (Wear and Aultman, 2005, p. 1059). Because this finding points to an important limitation, structural competency training in medical education should recognize that physicians have to be willing to learn about structural determinants of health and be equipped with tools to tangibly implement this training into practice.

**Implications for Present Study**

Social determinants of health and structural competency share a common goal of addressing society's role in shaping health outcomes. However, the implementation of such approaches does not always match this goal. Social determinants of health is a broad term used to describe an approach to social medicine; interventions that fall under this category address patients on a spectrum from the proximal level to the distal level. The literature demonstrates a misalignment between the goals of interventions that are named "social determinants of health" and the execution of the interventions. While the healthcare issues that SDOH and structural competency address might fundamentally be the comparable, providers must be trained to intervene on the most distal, structural level in order to meet the patient's healthcare needs. Health outcomes are a product of institutional and policy-level decisions. Interventions need to address the institutions and policies responsible for producing and maintaining health inequalities. Structural competency, as an approach to medical education, unifies approaches to social and structural issues in healthcare because the approach consistently trains providers to intervene at the most distal level.

Distinguishing characteristics that qualify a healthcare intervention as structurally competent include the recognition that structures influence patients' health, the practice of

healthcare, and the patient's experience inside the clinic and beyond (Neff et al., 2020, p. 2). While the SDOH approach can include the recognition of structural influences on health, it does not always include this recognition in the design of interventions. This fact sets structural competency apart. Structural competency can be employed to push the social determinants of health approach in medical education further toward addressing more distal determinants of health. With the growth of structural competency in medical education, the healthcare sector will have a common language for understanding and teaching the structural determinants of health.

While several studies have addressed the need for introducing structural competency into both undergraduate and graduate education, this study focuses on how vignettes can help assess understanding of structural competency in graduate education. The primary objective of this study was to design and test a vignette about a patient experiencing food insecurity for use in an online training module about structural competency. This study tested if readers of the vignette could recognize food insecurity as a structural issue and apply structural competency to a problem. By testing the design of the vignette and its associated assessment, this project demonstrates one mode through which structural competency can be taught in graduate education.

## METHODS: PHASE I

### Aims and Objectives

This is a two-phase study of a health vignette and assessment that is designed to be included in a structural competency module and/or casebook for residency education that teaches the five core competencies outlined by Metzl and Hansen. Phase I of the study was a pilot study of a vignette written about a patient experiencing food insecurity and a diabetes diagnosis. The

responses from Phase I were used to inform the design of the Phase II vignette and assessment. The research conducted in this study tested the internal validity of the vignette and its associated assessment.

**Procedure**

The vignette pilot assessment answered the following questions: is the audience able to recognize food insecurity from the description written about the patient and can the audience recognize that food insecurity is a structural issue? The design of the vignette was modeled after the Social Foundations of Health Survey that was distributed to MHS undergraduate students in 2017 by Metzl and Petty. A Google Form assessment and vignette, consisting of 8 open-ended questions, was administered to all 21 graduate students in Vanderbilt University's Department of Medicine, Health, and Society via email on December 4th, 2020. Responses were collected until December 9th 2020 and stored on a password-protected computer. The goal of this Google Form instrument was to test the internal validity of the vignette. The assessment questions relating to the vignette tested whether or not the composition of the vignette reveals the patient's structural barriers to accessing health, and more specifically, food. The assessment was also designed to test the participants' ability to recognize food insecurity and their ability to recognize that food insecurity is a structural issue. The participants were instructed to read three sections of the vignette and answer questions at the end of each section.

**Participants**

The Phase I food insecurity vignette was pilot-tested on current Vanderbilt University graduate students in the Department of Medicine, Health, and Society (MHS). This cohort of participants (N=6) will earn their Master of Arts degree in MHS after completion of the program. The participants have earned their Bachelor's degrees within one year of the study, have received

a basic level of structural competency training through the MHS curriculum, and are oriented toward studying health disparities. According to Vanderbilt University's website, "Medicine, Health, and Society is an interdisciplinary field of research that critically examines the social foundations of health. Graduate students learn about health-related beliefs and practices in their political, social, and cultural contexts" (vanderbilt.edu/mhs/graduate/ma-program/).

MHS graduate students were chosen as the pilot test group because they had been preliminarily trained on structural competency at a level that mirrors that of the resident physicians who will ultimately receive structural competency training through the AMA Reimagining Residency Initiative. MHS MA students are also oriented toward healthcare and many pursue medical school or health-related careers after they complete the MHS graduate program. This sample was attainable because all participants were able to be reached via their Vanderbilt emails. The enrollment target was 25 percent of the MHS MA cohort. The pilot study received a 26 percent response rate.

Limitations in regards to the sample do exist. Response bias limits the generalizability of this study because the participants self-selected to enroll. Another limitation to the generalizability of this study is selection bias. The Vanderbilt MHS MA cohort was a convenience sample and is not representative of the entire sample population that will be learning from the vignette in the structural competency training program.

**Vignette Design**

The three sections of the vignette were categorized as "Background," "Symptoms and Diagnosis," and "Treatment." The structural characteristics of food insecurity, according to Metzl and Hansen include racial disparities, socioeconomic status, access as it relates to housing, education, healthcare, transportation, and location of food deserts (2014). These elements were

incorporated into the health vignette about Ms. Smith (see Appendix A). Ms. Smith's vignette mirrored a story that would be included in a cultural competency training. Metzl and Hansen provide examples of vignettes that cultural competency trainings would include to show how "cultural" variables impact illness. For example, health professionals would read a vignette beginning with "Mrs. Jones is an African American woman in her mid-60s who comes late to her office visit and refuses to take her blood pressure medication as prescribed" and would then be taught to respond to this patient in a "culturally sensitive" way (Metzl and Hansen, 2014). The vignette in this study features a patient, Ms. Smith, who was recently diagnosed with diabetes. Instead of training participants to understand Ms. Smith's representation of illness as a product of her individual culture, the questions were designed to shift the focus toward cultures of oppression that structures represent. Ms. Smith's racial identity as Black, status as a single mother, and part-time employment status correspond with the relationship between food insecurity and racial/socioeconomic disparities. The fact that Ms. Smith struggled to pay rent and moved in with her daughter indicated housing insecurity. Her lack of access to a regular primary care physician and her decision to see a clinician at a free clinic indicated her struggle to access healthcare and insurance. She relied on the public transportation system, which indicated her lack of access to private transportation. The fact that she lived closer to a corner store than a grocery store demonstrated that she lived in a food desert. All of these indicators of food insecurity are rooted in structural barriers, which is the key takeaway that structural competency trainees should learn.

A key component of the vignette in this study is the last section, which describes the physician's treatment recommendation of eating a full fruits and vegetables and limiting fats and sugars. Ms. Smith responds to this recommendation by explaining that her family recipes are

"good for the soul" and that she has everything she needs at her neighborhood corner store. This feature parallels a vignette that would be included in cultural competency training because of the way it uses soul food cooking to signal Black culture. Structural competency shifts the gaze away from culture as a marker of difference and toward the structural factors at play. Instead of understanding Ms. Smith's use of her neighborhood corner store as a cultural preference, structural competency trains health professionals to understand her use of a corner store as a product of food access barriers

**Assessment Questions**

*Section 1: Background*

The first question asked the participants to comment on the identifiers that may have led to the issues Ms. Smith is facing. In order to eliminate the potential for the participants to be primed to think about food insecurity, this question was asked first. This question was also asked before any diabetes-related symptoms were described. The last sentence that the participants read before answering this question mentioned that Ms. Smith was "feeling off" but there were no details about the symptoms she was experiencing.

*Section 2: Symptoms and Diagnosis*

After reading about Ms. Smith's presentation of symptoms and tests leading to her diabetes diagnosis, the participants were asked to answer questions 2 and 3. Question 2 asked the participants to identify the issues that led to her diabetes diagnosis. This question was designed to test whether or not the participants were able to identify structural factors that influenced Ms. Smith's vulnerability to diabetes. The responses to this question provided information about pre-existing structural competency knowledge, which will be an important part of designing a

comprehensive training tool in the future. Question 3 asked the participants to identify the details in the vignette that cause suspicion that Ms. Smith faces barriers to accessing healthy foods.

*Section 3: Treatment*

In this section, the participants read about the doctor-patient interaction and were prompted to answer questions 4, 5, 6, and 7. The physician prescribed medication and made dietary recommendations. Ms. Smith met these recommendations with a comment about how her family recipes are "good for the soul." Ms. Smith also alluded to her lack of access to transportation and a nearby grocery store. This detail was designed to signal that she lived in a food desert. Question 4 asked the participants to reflect on the physician's recommendations. The vignette was designed to demonstrate how physicians often assume that patients have access to the goods and services they need to live healthy lives. Question 4 tests the participants' ability to use a structural competency approach to recognize this assumption.

Question 5 instructed the participants to imagine they were the physician in this scenario and write one question that they would ask Ms. Smith to better understand her access to food. This application question was designed to exercise the skills the participants would have learned from the structural competency training. Question 5 assesses the participants' ability to apply structural competency to a situation.

Question 6 is also an application question. It asks the participants to take the role of the physician and make recommendations based on what they know about Ms. Smith's food insecurity. Ideally, resident physicians would be well-equipped to provide resources to patients after receiving structural competency training.

Question 7 asked the participants to reflect on what additional information the physician would need to know about Ms. Smith's food accessibility in order to make appropriate

recommendations. This question was designed to encourage the participant to think about the limitations to structural competency. Structural competency works best when the physician has enough information about the patient's lifestyle in order to truly understand the structures that shape the patient's health outcomes. However, this is not always the case. This question prompts the participants to reflect on what is still missing about Ms. Smith's story.

*Section 4: Ms. Smith's Neighborhood*

Section 4 showed images of Ms. Smith's neighborhood. Question 8 asked if the images tell the participants anything new about Ms. Smith that they did not gather from the written vignette. This question was intended to help the design of the Phase II vignette.

## RESULTS/DISCUSSION: PHASE I

### *Validity*

Because the Phase I pilot study was not reviewed by the IRB, it was not possible to report data pertaining to the responses. The internal validity of the Phase I study is high. The study instrument sought to investigate participants' ability to firstly, identify food insecurity from Ms. Smith's vignette and secondly, recognize food insecurity as a structural issue. The vignette assessment allowed for qualitative analysis and the results showed that the instrument captured the participants' ability to do both. Thus, the internal validity of the pilot study was high.

This study did not have high external validity. The participants were selected from a convenience sample. The diversity and demographics of the intended audience for the AMA structural competency training tool differs from the participants in the pilot study. Thus, the sample from the pilot study was not generalizable to the sample that will receive the training.

*Modifications for Phase II*

The preliminary qualitative analysis of the pilot study informed subsequent modifications to the vignette and assessment questions. The design of the embedded questions throughout the vignette controlled for priming of issues related to food insecurity and tested the participants' ability to recognize and consider food insecurity as a structural determinant of diabetes. Thus, Phase II mirrored this format, but modifications were made to questions due to lack of significance and for added clarity and depth. Questions 5 and 7 were combined in Phase II because the responses did not show significant difference. The responses to Question 8 showed that the images of Ms. Smith's neighborhood added no significant value and were thus not included in Phase II. Additionally, a qualitative code was used to more systematically analyze and assess the responses to the questions in Phase II.

The open-ended questions in Phase I captured a broad range of discussion-style responses. However, the qualitative analysis of the open-ended questions would be enhanced with the presence of a closed-ended, rank-order question. Thus, a rank-order question was included as the last question of the assessment in Phase II. The decision to employ an online assessment and recruit participants via email in Phase I was made because of accessibility to Vanderbilt students. Thus, an online assessment and recruitment via email was used in Phase II. Google Forms as the study site was a weakness in Phase I because of the non-secure nature of the platform. Thus, the assessment was conducted via REDCap, a secure data-collection source, in Phase II.

The methods also had weaknesses and limitations that must be addressed. First, the participants had personal connections to the Principal Investigator, so self-enrollment was not free from bias. Self-enrollment also lends itself to response bias. To address this limitation,

Phase II was tested on a larger sample of graduate students across different Vanderbilt University programs. Thus, the demographic and educational diversity was stronger.

It is important to note that this vignette will become part of a comprehensive structural competency training tool. Thus, this study was not designed to test the vignette's ability to teach structural competency. Rather, the study tested the vignette on graduate students in order to assess the design before inclusion in a comprehensive tool that will be used to train healthcare professionals. As described above, the purpose of this study was to first test if the participants could identify food insecurity in the patient vignette. This was an important aspect of the vignette design that will be used to inform the creation of future structural competency training tools. Second, the participants' level of structural competency was measured using the qualitative analysis code. This measurement was important because the participants' pre-existing knowledge about food insecurity as a structural issue will be critical for the assessment that will accompany the future structural competency training tools. The third independent variable measured in this study was the participants' ability to apply structural competency to a problem. The application questions in the "Treatment" section of the vignette measured the third independent variable.

## METHODS: PHASE II

### Procedure

The Vanderbilt University Institutional Review Board determined that study (IRB #210144) poses minimal risk to participants. Thus, this study met 45 CFR 46.104 (d) category (2) for Exempt Review. Phase II of the food insecurity vignette assessment was administered to all MHS MA graduate students and Biological Sciences (BSCI) MS graduate students via email.

Department heads from both the BSCI and MHS graduate programs were sent a recruitment email that they were instructed to send to their graduate students. Responses were collected on REDCap from February 11th to March 11th and securely stored on a password-protected REDCap account. The instrument asked students to answer five written questions and one rank-order question. The instrument assessed students' perception of issues that the patient in the vignette is facing and their level of structural competency. According to Metzl and Petty's qualitative analysis code for a social foundations of health (SFH) evaluation tool, written responses to questions relating to health disparities were labeled as "individual-level, cultural-level, or structural-level" (2017). Metzl and Petty's definitions of individual, cultural, and structural included examples of factors that would fall into each categorical level. This code was used in the qualitative analysis of the written responses in the Phase II vignette assessment.

Table 1
*Phase II Qualitative Analysis Code*

| **Category** | **Factors** |
|---|---|
| Individual | Genetic<br>Lifestyle choices<br>Age |
| Cultural | Cultural background<br>Health traditions and beliefs<br>Health literacy<br>Physician bias |
| Structural | Access to healthcare<br>Health delivery system<br>Health insurance<br>Institutional racism<br>Medicalization<br>Individual or family income<br>Neighborhood factors<br>Social policies |

Source: Metzl, J. M., & Petty, J. (2017)

## Participants

To be included in the study, participants had to have been enrolled in Vanderbilt University as graduate students in either the Department of Biological Sciences or Medicine, Health, and Society. If participants were not enrolled in either one of these programs, they were excluded from the study. Information about the Vanderbilt program in which participants were enrolled was collected on the REDCap instrument.

Students were eligible for enrollment in the study regardless of race, ethnicity, gender, and age. Because participants were currently enrolled in either the Biological Sciences or the Medicine, Health, and Society graduate program, they were likely to enter health-related professions in the future. The results from the assessment will inform the creation of structural competency modules that are intended for an audience of healthcare providers. Thus, the participants who enter the healthcare field could benefit from future educational tools that will incorporate the vignette from this study's assessment.

## Sociodemographic Descriptive Measures

This subsection describes the sociodemographic information that was collected from the participants in the Phase II assessment. All participants were asked to answer the questions associated with sociodemographic factors.

### *Department*

Participants were asked to identify the Vanderbilt graduate department in which they were currently enrolled. They had the option of selecting Medicine, Health, and Society (MHS), Biological Sciences, and Other. Upon selection of the choice “Other,” participants were asked to further specify their department.

*Future Plans*

Participants were asked to select the field(s) they are planning to enter after they graduate from their current program. The options were dentistry, global health, healthcare administration, healthcare consulting, media and arts, law, medicine, nursing, policy, physical therapy, public health, research, and other. If participants selected "Other," they were prompted to specify.

*Race and Ethnicity*

Race/Ethnicity categories were reported by asking participants to select the racial and ethnic category that most represents how they identify. The categories were American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, White/Caucasian, Multiracial, and other.

*Gender Identity*

Participants were asked to choose all genders that applied to their identity. The options were woman, man, transgender, non-binary/non-conforming, and would rather not disclose.

*Age*

Participants selected which age (in years) group most accurately described them. The three options were 20-25, 26-30, and 31+. Because the participants are all graduate students, the age range from 20-31+ was appropriate.

**Vignette Design**

Phase I demonstrated that the structural issues the patient in the vignette faced were well-articulated because the participants picked up on the aspects of food insecurity that were intentionally included. Thus, the vignette itself did not change from Phase I to Phase II. The three sections titled "Background, Symptoms and Diagnosis, and Treatment" remained the same in Phase II. Also, the structure of the three sections separated by assessment questions remained

the same in Phase II. However, the assessment questions associated with the vignette did undergo changes.

**Assessment Questions**

The wording of Question 1 and placement in the "Background" section remained the same in Phase II. Question 2 remained the same in Phase II, as well. In Phase I, Questions 3 and 7 resulted in very similar responses. Thus, in Phase II, the essence of these questions was combined to create a rank-order question as the final assessment question. The Phase II "Treatment" section contained three questions instead of four. The three questions that remained in this section used the same wording as Questions 4, 5 and 6 in Phase I.

Phase II did not contain images of the patient's neighborhood because it was not representative of a realistic patient-doctor interaction. It is rare that a physician would be able to visualize or obtain photographs of their patient's neighborhood. Instead of photographs of the neighborhood as the last section of the assessment, Phase II includes a rank order question.

The rank order question asks participants to rank the following factors that prevent the patient from eating nutritious foods in order of significance. The options include two factors that are categorized as "individual-level," two factors that are categorized as "cultural-level," and two factors that are categorized "structural-level," according to Metzl and Petty's code.

## RESULTS/DISCUSSION: PHASE II

This study examines the topic of structural competency by asking the question: can an online module featuring a vignette help graduate students identify and analyze structural factors related to food insecurity? The vignette assessment included five open-ended questions that required written responses and one closed-ended question. The first section of the vignette

assessed the first independent variable, the participants' ability to recognize food insecurity. The second section of the vignette assessed the second independent variable, the ability to recognize structural issues. The third vignette section assessed the third independent variable, the ability to apply structural competency to treatment options.

*Student Sociodemographics*

Phase II of the vignette assessment was completed by eight graduate students in two different Vanderbilt University departments, Biological Sciences and MHS. Five MHS students and three Biological Sciences students participated in the study. Participants were asked to select the field(s) they were planning to enter after graduation. One student planned to enter the dentistry profession, one student planned to enter the healthcare consulting, one student planned to enter the media and arts field, one student planned to enter medicine, two students planned to go into policy, two students planned to enter the public health field, and three students planned to go into research. No students planned to enter the global health, healthcare administration, law, nursing, or physical therapy fields.

One participant identified as Black or African American, five students were white, and two students identified their race/ethnicity as "other." Six participants identified as women and two participants identified as men. Seven participants were in the 20-25 age range and one participant was in the 26-30 age range.

*Ability to Recognize Food Insecurity*

The first section of the vignette included Question 1 and assessed the participant's ability to recognize food insecurity, which was the first independent variable (see Appendix B). Based on the assessment responses, four out of eight participants included structural factors in their responses, but only one out of eight participants identified food insecurity as a factor that led to

Ms. Smith's issues. This result is unsurprising because the vignette did not yet mention Ms. Smith's diabetes diagnosis or neighborhood location in a food desert. The participant response that signaled the ability to identify food insecurity included information about:

> *"Ms. Smith is a low-SES, older woman of color which means she most likely has trouble affording adequate healthcare and nutritious foods. Because her children are older than 18 and she is under 65, she will not qualify for Medicaid, so unless she gets health insurance from her job (which seems unlikely because she is a substitute teacher which is part-time), she will have to purchase her own insurance."*

By referencing insurance and health care and food access, this response demonstrated an acknowledgement of larger structures

Students with an individual-level response did not acknowledge the structures at play that could have been causing Ms. Smith to "feel off." For example, one student discussed the manifestation of disease from a biological standpoint:

> *"Stress from work and expenses and balancing taking care of the household leading to lowered immune system function; possible difficulty adjusting to sleep in a new living situation; possible infection that was caught from one of the children."*

This response did not acknowledge the structures at play that could have been causing Ms. Smith to "feel off." Instead, this response discussed the manifestation of disease from a biological standpoint. Another example of a response that addressed the causes of Ms. Smith's issues on an individual level said:

> *"A move also introduces a new environment (house and neighborhood, associated abiotic environment, diet, etc.). Potentially different amount of contact with acquaintances, friends, religious community, and more distant family members."*

This response discussed the impact of moving to a new place on interpersonal relationships. Interpersonal relationships operate on a micro level that is specific to Ms. Smith's life as an individual. Thus, it does not acknowledge the structures at play that contribute to Ms. Smith's health.

The results from Question 1 demonstrated that the design of the vignette did not successfully assess the first independent variable. The ability to recognize food insecurity was an important aspect of the design of the vignette, but there were not enough features of Ms. Smith's story in Section 1 that pointed to food insecurity. Thus, this independent variable should have been assessed in later sections of the vignette in which Ms. Smith's diagnosis of diabetes and description of methods of food procurement were discussed.

*Identifying the Individual, Cultural and Structural Variables*

The second section of the vignette included Question 2, which assessed the second independent variable: participants' ability to recognize structural issues. While roughly the same percentage of MHS and BSCI students included structural and cultural factors in their responses, more BSCI students included individual-level factors that contributed to Ms. Smith's diabetes diagnosis.

Table 2

*Response Patterns of Factors Contributing to Diabetes Symptoms and Diagnosis*

| **Student response type** | **No. (%) of total responses** | **No. (%) of MHS responses** | **No. (%) of BSCI responses** |
|---|---|---|---|
| Response discussed individual-level factors that contribute to diabetes (genetics, lifestyle choices, age) | 4 (44.4) | 2 (40) | 2 (66.7) |
| *Example of individual-level response: "no primary care physician, diet"* | | | |
| Response discussed cultural-level factors that contribute to diabetes (cultural background, health traditions and beliefs, health literacy, physician bias) | 2 (25) | 1 (20) | 1 (33.3) |
| *Example of cultural-level response: ". . . due to a common lack of trust in the healthcare system among the Black community, she may have avoided regular physician check-ups up to this date to catch pre-diabetic symptoms."* | | | |
| Response discussed structural-level factors that contribute to diabetes (access to healthcare, health delivery system, health insurance, institutional racism, medicalization, individual or family income, neighborhood factors, social policies) | 5 (62.5) | 3 (60) | 2 (66.7) |
| *Example of structural-level response: "Ms. Smith is a low-SES individual, so she probably has trouble affording nutritious foods to prevent diabetes."* | | | |

The results in Table 2 point to respondents' varying levels of structural competency in responses related to the factors contributing to diabetes. Table 2 results display the second independent variable, respondents' ability to recognize structural issues. The differing percentage of individual-level responses from MHS and BSCI students suggests different levels of pre-existing structural competency knowledge. Different levels of pre-existing knowledge of structural competency should be considered in the development of future structural competency modules. A pre-test assessment is a potential avenue through which pre-existing structural competency knowledge can be measured.

*Applying Structural Competency to Treatment Options*

The third section of the vignette included Questions 3, 4 and 5, which assessed the third independent variable, participants' ability to apply structural competency to treatment options. Question 3 asked participants to assess the physician's recommendations and identify the assumptions the physician made. This question successfully assessed participants' ability to apply structural competency. Four out of five MHS participants and all three BSCI participants included assumptions about access to healthy foods, which demonstrates an understanding of structural competency. Three out of five MHS participants and all three BSCI participants included individual-level aspects in the written responses. Two out of five MHS participants and zero BSCI participants included cultural-level components. An example of a structurally competency response was, "The physician assumes Ms. Smith not only has the money to accommodate this diet change but also she has access to fruits and vegetables on a regular basis." An example of a cultural-level response was, "The physician also might have assumed that the food [Ms. Smith] cooks has an abundance of fats and sugars when it could in actuality be healthy." This response was categorized as cultural-level because it included "health traditions and beliefs," a factor coded as cultural-level. An example of an individual-level response was, ". . . the physician doesn't ask questions about Ms. Smith's lifestyle before making their recommendation." Because this response describes lifestyle choices, it was coded as individual-level. This application-based question gave rise to responses that were coded as individual, cultural, and structural and thus the question assessed the participants' ability to apply structural competency to treatment options.

Response patterns from Questions 4 and 5 are reported in Table 3. Question 4 prompted participants to play the role of the physician by asking one question that would help understand

Ms. Smith's food accessibility. Participants wrote structural and individual-level responses, but there were no responses coded as cultural-level responses. It is likely that a large percentage of participants gave structural-level responses because the question prompted participants to think about food access as a contributing factor to Ms. Smith's diabetes. Results from this question are reported in Table 3 as the prompt "asking the patient about food access."

Question 5 is reported in Table 3 as the prompt "proceeding with treatment for the food-insecure patient." Because Ms. Smith was identified as a food-insecure patient in the question, participants were primed to understand her illness as a result of food insecurity. Thus, five out of eight respondents included structural-level answers. This question assessed the third independent variable, ability to apply structural competency to treatment options, because it asked participants to play the role of the physician caring for a food-insecure patient. There was no significant difference between levels of demonstrated structural competency in MHS and BSCI students.

Table 3
*Response Patterns Related to Application of Structural Competency*

| **Prompt** | **Student response type** | **No. (%) of total responses** | **No. (%) of MHS responses** | **No (%) of BSCI responses** |
|---|---|---|---|---|
| Asking the patient about food access | Response discussed individual-level factors | 6 (75) | 4 (80) | 2 (66.7) |
| | Response discussed cultural-level factors | 0 (0) | 0 (0) | 0 (0) |
| | Response discussed structural-level factors | 5 (62.5) | 3 (60) | 2 (66.7) |
| Proceeding with treatment for the food-insecure patient | Response discussed individual-level factors | 2 (25) | 1 (20) | 1 (33.3) |
| | Response discussed cultural-level factors | 6 (75) | 4 (80) | 2 (66.7) |
| | Response discussed structural-level factors | 5 (62.5) | 3 (60) | 2 (66.7) |

Table 4 reports the results from Question 5 in the vignette, which asked participants to rank six factors in order of how significantly they prevent Ms. Smith from eating nutritious foods. The factors were categorized according to the qualitative analysis code. Out of the six factors that participants were asked to rank, two factors fell into each of the three categories: individual, cultural, and structural. The two individual-level factors included *food preference* and *food allergies/dietary restrictions*. The two cultural-level factors were *cultural traditions/beliefs about food* and l*ack of knowledge about healthy food*. The two structural-level factors were *lack*

*of access to a grocery store* and *food options at the corner store*. A lower mean score represents a less significant factor and a higher mean score represents a more significant factor. Higher scores for the structural factors represents a greater understanding of structural competency. The results in Table 4 show respondents' understanding of the significance structural factors play in Ms. Smith's story. Both MHS and BSCI students understand structural factors to play a significant role in preventing Ms. Smith from eating nutritious foods.

Table 4
*Response Patterns Related to Rank-Order Question*

| **Categorical Level of Factor** | **Mean score of total responses** | **Mean score of MHS responses** | **Mean score of BSCI responses** |
|---|---|---|---|
| Individual | 2.3125 | 2.2 | 2.5 |
| Cultural | 3.5 | 3.9 | 2.8333 |
| Structural | 4.6875 | 4.4 | 5.1667 |

Overall, the food insecurity vignette assessment tested three independent variables, all of which are important to consider when designing a structural competency training program for future and current physicians. The ultimate goal of a program of this type is to train physicians to recognize the structural determinants of health outcomes, ask patients questions to better understand how access to resources contribute to health, and implement treatment options that consider the structural barriers at play. The results showed that the designs of the vignette and assessment test the intended independent variables. When implemented as a component of a larger training program, this vignette will showcase how structural factors, like SES and neighborhood design, contribute to disease. The results showed no significant difference of level of structural competency between MHS and Biological Sciences graduate students, which demonstrates that the lack of a unified approach to training students in the social and structural determinants of health contributed to the difficulty coding participant responses. Language about

SDOH has become so ubiquitous in health that it has become increasingly hard to determine whether the respondent's approach demonstrates a concern with 1) more proximal or distal SDOH issues or 2) more individual, cultural, or structural factors.

This study's findings would be enhanced with the presence of a vignette showcasing privilege as structural determinant of diabetes. An example of a vignette featuring a patient whose privilege impacts health outcomes is the following:

> *Mr. Clark, A middle-aged, white man travels an average of 100 days a year for his corporate job. Because he is constantly flying from one city to the next and staying in hotels without access to kitchens, the majority of his meals are fine dining, fast food, or carry-out. The built environments of the cities to which he travels and the hotels in which he stays create structural barriers to accessing reliable, nutritious, and fresh food. The meals most accessible to him as he travels from city to city are high-end restaurants, which are not reliably affordable or nutritious. These structural factors contribute to his recent diabetes diagnosis.*

The juxtaposition of structural racism in Ms. Smith's story and privilege in Mr. Clark's vignette demonstrates the breadth of structures that structural competency seeks to address.

A major challenge to the data analysis of the vignette assessment was that many responses did not fall neatly into one of the three categories defined by the qualitative analysis code. Answers with ambiguous reasoning behind factors included in the response were not classified in any of the three categories. An example of a response of this type comes from Question 4, which asked participants to write one question they would ask Ms. Smith to better understand her food access. The example reads, "where do you shop for food?" The meaning behind this question was not clear. The participant could have been asking this question with

food preference in mind, which is an individual-level factor. The participant could have also been asking this question with cultural traditions of food in mind, which is a cultural-level factor. Or, the participant could have been asking this question to find out if the patient lives in a food desert, which is a structural-level factor. Because this was not clear from the response alone, the response was not able to be categorized according to the qualitative analysis code. This situation occurred multiple times during data analysis. A solution to this issue would be to include a space to ask why after each question in the assessment. This would allow participants to elaborate on the meaning of their responses, which would elucidate the category that the responses fell into. Another solution could be to create a category of responses called "undefined," which would provide a space to report inconclusive responses.

## CONCLUSION

Graduate medical education needs structural competency to unite efforts to address health disparities rooted in causes beyond the walls of the clinic. Food insecurity as a case study exhibits the tension between the terms "social" and "structural" in designing medical interventions and educational curricula. As such, it is important that students and practicing healthcare professionals work to understand the ways in which structural environments manifest in health disparities. In addition to understanding this relationship, it is crucial that healthcare professionals are equipped with tools to address structural issues with structural interventions in the clinic. In this study, graduate students were able to identify food insecurity in a health vignette and apply structural competency to an issue. Physicians who are trained in structural competency can deliver more appropriate care to patients experiencing food insecurity.

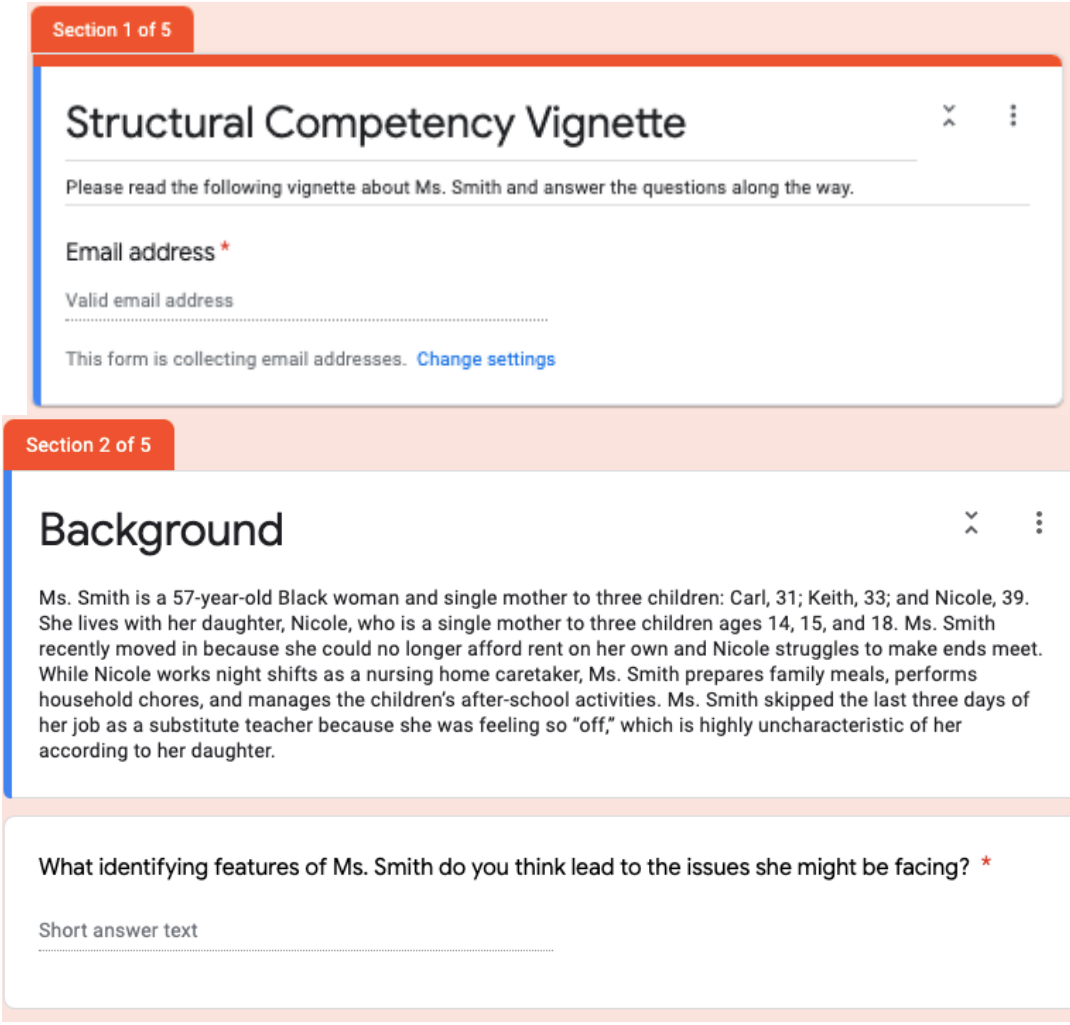
Recent public health crises, like the ongoing COVID-19 pandemic, have simultaneously increased the public attention to structural foundations of health and increased the viability of online learning. While the global movement towards online modes of learning has gained momentum over the last decade, the COVID-19 pandemic has brought visibility and urgency to the process. Online learning, also known as web-based learning, boosts access and cost-effectiveness of education and training (Panigrahi et al., 2018, p. 1). More specifically, pedagogical research on digital formative assessment is promising. The advantages of digital assessment include the ability to identify strengths and deficiencies in students' learning and to give feedback on the teaching techniques of teachers (Amasha et al., 2018, p. 3). Online assessment allows for instructors to reach a broad audience without geographic limits. Online assessment can support "teaching for teachers and learning for students" (2018). Thus, the online format of this study's health vignette assessment fits into the movement toward the use of online assessment tools. This study's vignette was designed to be included in a comprehensive structural competency training module. Thus, this project's assessment tool will be useful for assessing the efficacy of future structural competency training modules.

One powerful structural determinant of health is structural racism, an issue with deep historical roots in the United States and has recently gained public attention in the summer of 2020 Black Lives Matter protests. After the Minneapolis police killing of George Floyd in May 2020, protests galvanized American and worldwide public support for Black Lives Matter and the racial justice movement. The movement spread awareness that police brutality is a symptom of a larger issue: systemic racism. And like structural competency argues, we cannot just treat symptoms. Instead, we must shift the focus to the root cause of health disparities. While the present research demonstrates the need for structural competency to equip healthcare

professionals with the tools to address the social, economic, and political factors that contribute to patient and community health, future research must look to the effects this training has on minimizing or eliminating healthcare disparities. Further, it is important to examine how non-healthcare sectors, like education, urban planning, and policy, can benefit from taking a structural approach when designing interventions.

Overall, this study advances the scholarship about the role structural competency can play in graduate medical education. Structural competency enables healthcare professionals to provide care in a way that accounts for the social and structural influences on health. This study's online health vignette is one mode through which physicians can understand and address food access through the lens of structural competency. As previously discussed, structural competency differs from the SDOH framework in that structural competency includes structures of privilege as determinants of health. Future structural competency research and training should address issues of privilege. The results of this study demonstrate that structural competency differs from the SDOH framework in graduate medical education in its commitment to training providers to understand and treat distal determinants of health.

APPENDIX A
PHASE I PILOT HEALTH VIGNETTE ASSESSMENT



Section 3 of 5

# Symptoms and Diagnosis

After much debate and hesitation, her daughter decided it was time to see a doctor. Because she does not regularly see a primary care physician, her daughter found the nearest free clinic and made a same-day appointment. Ms. Smith arrived with her daughter at the Shade Tree Clinic presenting with increased urination and thirst, dizziness and nausea, and poor circulation in her feet that she had been experiencing for over a month. At the clinic, Ms. Smith was given tests that lead to a diagnosis of diabetes.

What do you think are the issues Ms. Smith is facing that have led to her diabetes diagnosis? *

Long answer text

What details in this vignette cause you to suspect Ms. Smith is facing barriers to accessing nutritious foods? *

Long answer text

Section 4 of 5

## Treatment

The physician prescribed Ms. Smith Metformin once a day and suggested limiting her daily caloric intake to 1500 calories. The physician recommended eating a full serving of fruits and vegetables daily and limiting fats and sugars. When given these recommendations, Ms. Smith explained that the family recipes she cooks are good for the soul. The closest supermarket is a bus ride away, but her neighborhood corner store has all the ingredients she needs.

Think about the physician's recommendations. What did they do well and what could they improve on? What assumptions did they make? *

Long answer text

Imagine you are the physician in this situation. What is one question you would ask Ms. Smith to better understand her food accessibility? *

Long answer text

How would you proceed with your recommendations after learning that she is food insecure? *

Long answer text

What additional information would the physician need about her food accessibility in order to make good, appropriate recommendations? *

Long answer text

Section 5 of 5

# Ms. Smith's Neighborhood

Below are pictures of Ms. Smith's neighborhood in Nashville.

Dickerson Pike (37202)


What do these pictures tell you about Ms. Smith that you didn't already know from the vignette, if anything? *

Long answer text

APPENDIX B
PHASE II REDCAP HEALTH VIGNETTE SURVEY

*Confidential*



# Health Vignette Survey

Please complete the survey below.

Thank you!

| | |
|---|---|
| Welcome!<br><br>Your responses to this survey will be collected and analyzed for the purpose of creating a training module for future medical professionals. Personal identifying information will not be collected and your identity will remain confidential in the written report of the results. Participation in this research is voluntary. You may choose not to participate or change your mind later. Do you consent to these terms and will you proceed with the survey?<br><br>If you have any questions about the exam, please contact Rachel Gross, MHS MA candidate, at rachel.gross@vanderbilt.edu. | ◯ I consent for my data to be used for research<br>◯ I do not want my data to be used for research |
| In which Department are you currently enrolled? | ◯ Medicine, Health, and Society<br>◯ Biological Sciences<br>◯ Other |
| If you selected "Other" for Department, please specify: | _____ |
| 5. What field(s) are you planning to enter after you graduate from your current program? | ☐ Dentistry<br>☐ Global health<br>☐ Healthcare administration<br>☐ Healthcare consulting<br>☐ Media and arts<br>☐ Law<br>☐ Medicine<br>☐ Nursing<br>☐ Policy<br>☐ Physical therapy<br>☐ Public health<br>☐ Research<br>☐ Other<br>(*You may select more than one.) |
| If you selected "Other" for future plans, please specify: | _____ |
| I identify my race and ethnicity as: | ◯ American Indian or Alaska Native<br>◯ Asian<br>◯ Black or African American<br>◯ Hispanic or Latino<br>◯ Native Hawaiian or other Pacific Islander<br>◯ White/Caucasian<br>◯ Multiracial<br>◯ Other |

| | |
|---|---|
| I identify my gender as: (choose all that apply) | ☐ Woman<br>☐ Man<br>☐ Transgender<br>☐ Non-binary/non-conforming<br>☐ Would rather not disclose |
| Age | ◯ 20-25<br>◯ 26-30<br>◯ 31+ |

**Please read the following vignette about Ms. Smith and answer the questions along the way.**

**Section 1: Background**

Ms. Smith is a 57-year-old Black woman and single mother to three children: Carl, 31; Keith, 33; and Nicole, 39. She lives with her daughter, Nicole, who is a single mother to three children ages 14, 15, and 18. Ms. Smith recently moved in because she could no longer afford rent on her own and Nicole struggles to make ends meet. While Nicole works night shifts as a nursing home caretaker, Ms. Smith prepares family meals, performs household chores, and manages the children's after-school activities. Ms. Smith skipped the last three days of her job as a substitute teacher because she was feeling so "off," which is highly uncharacteristic of her according to her daughter.

1 What identifying features of Ms. Smith do you think lead to the issues she might be facing? Please explain why.

_____

**Section 2: Symptoms and Diagnosis**

After much debate and hesitation, her daughter decided it was time to see a doctor. Because she does not regularly see a primary care physician, her daughter found the nearest free clinic and made a same-day appointment. Ms. Smith arrived with her daughter at the Shade Tree Clinic presenting with increased urination and thirst, dizziness and nausea, and poor circulation in her feet that she had been experiencing for over a month. At the clinic, Ms. Smith was given tests that lead to a diagnosis of diabetes.

2 What do you think are the issues Ms. Smith is facing that have led to her diabetes diagnosis?

_____

**Section 3: Treatment**

The physician prescribed Ms. Smith Metformin once a day and suggested limiting her daily caloric intake to 1500 calories. The physician recommended eating a full serving of fruits and vegetables daily and limiting fats and sugars. When given these recommendations, Ms. Smith explained that the family recipes she cooks are good for the soul. The closest supermarket is a bus ride away, but her neighborhood corner store has all the ingredients she needs.

3 Think about the physician's recommendations. What did they do well and what could they improve on? What assumptions did they make?

_____

4 Imagine you are the physician in this situation. What is one question you would ask Ms. Smith to better understand her food accessibility?

_____

5 How would you proceed with your recommendations after learning that she is food insecure?

_____

**What is preventing Ms. Smith from eating nutritious foods? Rank the following factors in order of significance (1 means most significant, 6 means least significant).**

| | Most significant (1) | (2) | (3) | (4) | (5) | Least significant (6) |
|---|---|---|---|---|---|---|
| Food Preference | ○ | ○ | ○ | ○ | ○ | ○ |
| Lack of access to a grocery store | ○ | ○ | ○ | ○ | ○ | ○ |
| Lack of knowledge about healthy foods | ○ | ○ | ○ | ○ | ○ | ○ |
| Food allergies or dietary restrictions | ○ | ○ | ○ | ○ | ○ | ○ |
| Cultural traditions/beliefs about food | ○ | ○ | ○ | ○ | ○ | ○ |
| Food options at the corner store | ○ | ○ | ○ | ○ | ○ | ○ |

6 In a few sentences, please explain why you chose this ranking for the factors preventing Ms. Smith from eating nutritious foods. _____

You have completed the Health Vignette Survey.

If you have any questions or concerns please feel free to contact Rachel Gross, MHS MA candidate, at rachel.gross@vanderbilt.edu

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