EFFECTS OF AN EDUCATION INTERVENTION ON IMPLEMENTING A SOCIAL DETERMINANTS OF HEALTH SCREENING TOOL IN PRIMARY CARE

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ABSTRACT

The purpose of the project is as follows: (a) Assess an education intervention regarding Social Determinants of Health (SDH) on clinical staff, (b) Integrate and evaluate a SDH screening tool called PRAPARE into clinical practice, and (c) Describe the findings of patients who were screened. SDH are social and environmental conditions in which people are born, live, work, and play.

SDH accounts for approximately 90% of a person’s health status, and healthcare is responsible for the remaining 10%. The Institute of Medicine recommends screening and addressing SDH in primary care to improve health status, but little research has been done evaluating screening tools or impact.

Racial minorities and those living below the poverty level are at disproportionate risk of being uninsured, lacking access to care, receiving poorer quality of care, and experiencing worse health outcomes. In 2015 the National Association for Community Health Centers developed a 20-question screening tool PRAPARE to assess and address patients’ SDH.

An education intervention regarding SDH and the PRAPARE tool was provided to clinic staff. One survey was sent to clinical staff after training, and a second survey was sent 12 weeks later. In addition, a convenience sample of adults in a primary care setting was screened over a 12-week period using PRAPARE. A descriptive analysis was used to illustrate the results of both patient and staff responses.
Of the clinical staff trained, 15 completed both the post-education survey, and the second survey evaluating the implementation of PRAPARE. Participants rated the training highly. Nonetheless, participants expressed concern with their comfort in being able to integrate PRAPARE into practice, comfort in utilizing the tool, and identified lack of time as the biggest barrier. Of 222 patients screened, the mean age was 53.4 years, 73.9% were Black/African American, 18% Spanish speaking, 78.8% were living below the poverty line, 40% were unemployed and seeking work, 35% did not have housing, 37% were socially isolated, and 22% lacked access to food. There was no statistically significant correlation between the PRAPARE score and either Hemoglobin A1c or blood pressure.
DEDICATION

After years of working with underserved populations and hearing the lived experience of poverty, paired with learning the gravity of healthcare disparities, structural racism, and wealth inequality through this project I dedicate this body of work to my beloved patients who shared their lives with me. I have learned more than I could ever comprehend and they helped make me a better person.

To my faculty mentor, Dr. Edilma Yearwood, thank you for being an inspiration and a constant source of support and wisdom. Your steadfastness was exactly what I needed and helped me to find my footing even when I felt crazed. Your passion and dedication to your work has been and will continue to be an inspiration for me in my career. Dr. Peggy Slota, thank you for your dedication to the “Twelve Pack”. Your calm steady spirit helped to usher us through one of the most stressful times of our lives and helped us all to be successful. To the Twelve Pack, I could not have chosen more amazing human beings to share this journey with. It has been my utmost pleasure to see you all soar.

To my mother, I am grateful for the quiet humble determination she has modeled and the unwavering support she has always provided. To my brothers and sisters, I could not have made it through this journey without each of your encouragement, affirmation, and love. This is when having nine siblings reaps its rewards. To my husband, there are no words of gratitude sufficient to reflect the amount of sacrifice you have made for me to complete this program. For all of the thankless work of being my biggest cheerleader, simply I could not have done this without you. To my friends and colleagues, for the listening ears, shoulders to cry on, brainstorming sessions, ceaseless patience, and for sharing in my joy; I am forever grateful. With a big heart and deep gratitude thank you!
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Chapter I

Introduction

Statement of the Problem

Social factors such as low level of education, racial segregation, low social support, poverty, and income inequality can lead to premature death (Galea, Tracy, Hoggatt, DiMaggio, & Karpati, 2011; Minino, Arias, Kochanek, Murphy, & Smith, 2000). There is mounting evidence demonstrating how racism, violence, poverty, and lack of education continue to perpetuate healthcare disparities across the United States (Lantz et al., 1998; Liao, McGee, Kaufman, Cao, & Cooper, 1999; Marmot, Shipley, Brunner, & Hemingway, 2001; Marmot et al., 1991; Singh & Kogan, 2007; Singh & Siahpush, 2006). Racial minorities and those living below the poverty level are at a disproportionate risk of being uninsured, lacking access to care, receiving poorer quality of care, and experience worse health outcomes (Booske et al., 2010). With pervasive healthcare disparities, a great deal of research is needed to improve the way the healthcare system understands and addresses social determinants of health.

As healthcare in the United States (US) has evolved to focus on patient centered care, care coordination, and quality-based reimbursement, a great deal of interest has emerged surrounding social determinants of health (SDH) and their significant impact on health outcomes. The World Health Organization (WHO; 2016) defines SDH as the social and environmental conditions in which people are born, live, work, and play. SDH account for approximately 90% of a person’s health status, and the current healthcare system is responsible for the remaining 10% (McGinnis, Williams-Russo, & Knickman, 2002). It is difficult to ascertain how much each specific SDH factor impacts a person’s health status, but it is clear that
one’s zip code can be a predictor of life expectancy (Institute for Health Metrics and Evaluation, 2014).

Background and Problem Significance

McGinnis and Foege (1993) characterized the causes of death across the US in 1990, resulting in a landmark study that helped usher in a paradigm shift. The researchers examined death certificates and identified heart disease, cancer, cerebral vascular disease, accidents, and chronic obstructive pulmonary disease as the top five pathophysiologic causes of death. Diseases and injuries are often multifactorial and the death certificates did not reflect the root causes of death (McGinnis & Foege, 1993). The cause of death in half of the individuals was attributable to non-genetic factors such as firearms, diet/activity, tobacco, and alcohol. Since this study, further research has categorized these non-genetic factors into major domains, including individual behaviors, social environment characteristics, environmental conditions, and health care (CDC, 2014; HHS, 2016b; McGinnis et al., 2002). Longitudinal studies examining the impact of socioeconomic status (SES) on health outcomes revealed that the incidence of developing health problems was higher in lower SES groups (Fox, Goldblatt, & Jones, 1985; Marmot et al., 1991; Rose & Marmot, 1981). The inverse was also true; the higher the SES, the lower the incidence of developing health problems. This suggests that there is a causal relationship between SES and health outcomes with SES as the main driver of healthcare disparities.

A growing body of evidence revealing the impact of social determinants on health outcomes, in combination with implementation of the Affordable Care Act in 2010, helped to usher in a new focus on primary care (Cutuli, et al., 2013; Kim, et al., 2013; Laraia, Siega-Riz, Gundersen, & Dole, 1996). Historically, public health and health care delivery systems
functioned in their individual silos. SDH data collection was part of the role of public health and was not viewed as an integral part of primary care. In 1988, the Institute of Medicine (IOM) published The Future of Public Health, which defined the role of public health in three key areas: assessment, policy development, and assurance. Assessment included the collection, assembly, and analysis of the health status of communities, health needs, and epidemiology. Over 20 years later, in 2012, the IOM convened a working group to create a report developed by both the Center for Disease Control (CDC) and Health Resources and Service Administration (HRSA) to help address chronic illnesses by integrating public health with primary care. In the report, one of the areas identified as a space of synergy between public health and primary care was the ability to use clinical practice to identify and address community health problems.

Current approaches to addressing SDH focus on population-based interventions, which overlook the potential benefit of collecting and addressing SDH in a clinical setting. Integrating SDH information within the Electronic Health Record (EHR) provides clinicians with the ability to address and track the impact of SDH on long-term health outcomes (Gottlieb, Sandel, & Adler, 2013). On an individual level, providing this information to a clinician allows treatment plans to be tailored to a patient’s needs while also understanding his or her barriers to care. Additionally, incorporating this information into the EHR could provide insight into how specific determinants impact health outcomes, which could help to fill in current gaps in research and knowledge. On a clinical level, this information would allow organizations to better utilize resources to meet the population’s needs.

**Evolving frameworks.** Over the past 30 years, there has been an evolution in the contextual framework of SDH. Whitehead and Dalgren (1991) developed one of the most widely cited models, which presents a social model of health (Appendix A). The model contextualized
an individual’s choice and behavior with socioeconomic and environmental factors and the combined impact on health. The model is portrayed as a rainbow with five layers, and places the individual in the center. The first layer of the model contains individual factors such as age, gender, ethnicity, and genetics. This layer was initially conceived as being non-modifiable, but developments in genetic engineering and transgender health, that is no longer the case. The second layer of the model contains individual lifestyle factors, such as food consumption and tobacco and illicit drug use. The third layer contains social and community networks, which include family, friends, and the wider community. The fourth layer accounts for living and working conditions, which encompass a wide variety of factors like access to healthcare services, education, running water, transportation, clothing, housing, employment, and healthy foods. The fifth and last layer includes socio-political, socio-economic, cultural, and environmental factors. This level addresses the political stability of a region based on its infrastructure, jobs and job creation opportunities, educational institutions, and environmental factors like clean air and water.

Subsequently, in 1998, Diderichsen developed the model of “the mechanisms of health inequality,” which places social position at its center. His model emphasized the impact of social status on health outcomes (Evans, 2001). He underscored the differential exposure, vulnerability, and consequences across the socioeconomic gradient. In 2007, the WHO went on to further develop and combine the Whitehead and Dahlgren model with Diderichsen’s model to create the conceptual framework for action on the social determinants of health (SDH; Appendix B). The WHO set out to develop a framework under which policies and programs could be developed to address SDH with the aim of eliminating healthcare disparities. The conceptual framework for tackling SDH inequities can be found in Appendix C.
History of community health centers. In the 1960s, President Johnson’s “War on Poverty” ushered in a new era in healthcare. During this time, healthcare pioneers like Dr. Geiger, a civil rights activist and young medical student, witnessed firsthand how a community-based healthcare model brought health benefits to the most oppressed citizens of apartheid South Africa (NACHC, 2017). Dr. Geiger and other healthcare pioneers submitted proposals to the Office of Economic Opportunity and subsequently the first proposal for the US version of a community health center was developed (RCHN, 2017). Congress also helped cultivate this new direction in health care by passing several key pieces of important legislation. First, the Social Security Act was amended with the passage of the Kerr-Mills measure (1960), which provided states with grant money for the medically underserved (Peters, 2004).

The subsequent passage of the landmark Economic Opportunity Act of 1964 marked the birth of America’s Community Health Centers. The resultant health center model targeted the roots of poverty by combining local community resources with federal funds to establish neighborhood clinics in both rural and urban areas around the US. This formula not only empowered communities, but also generated compelling evidence that affordable and accessible health care produced compounding benefits (HRSA, 2016; National Committee for Quality Assurance (NCQA), 2015; Yoon, Fryar, & Carroll, 2015).

In 1987, federal funding expanded to cover health care for the homeless organizations, thereby bringing the community health center model to a population with a disproportionate amount of social and medical needs (Zlotnick, Zerger, & Wolfe, 2013). Through the 1970s, Congress authorized separate primary health care programs for migrant, homeless, and public housing populations. The Health Centers Consolidation Act of 1996 combined these authorities
under section 330 of the Public Health Service Act and the programs received the designation of Federally Qualified Health Centers (FQHCs; 42 USC 254b, 1996).

Currently, there are over 1300 Community Health Centers in the US, with over 9000 service sites in every state and US territory. These health centers serve over 24 million people, 71% of whom live below the poverty line (NACHC, 2016). Half of health center patients live in rural areas, while the other half are located in impoverished inner city communities (NACHC, 2016). Health centers serve communities that would otherwise confront economic, geographic, language, cultural and other barriers to care, making these centers different from hospitals and most private physicians’ offices. Health centers are located in high-need areas identified by the federal government as having elevated poverty, higher than average infant mortality, and fewer practicing medical providers (NACHC, 2016).

FQHCs provide access to care to all residents, regardless of insurance status, and provide free or reduced cost care based on ability to pay (Heisler, 2017). With a team-based approach, the care model integrates healthcare providers such as nurses, physicians, dentists, nurse practitioners, midwives, and physician assistants with a variety of other professionals like social workers, mental health clinicians, and community health workers (Heisler, 2017; NACHC, 2016). Nearly a quarter of all health center patients are best served in languages other than English, and nearly all patients report that their clinician speaks the same language as them (NACHC, 2016). The services are tailored to fit the special needs and priorities of their communities, and to provide services in a linguistically and culturally appropriate setting. The team-based, community-oriented, and culturally sensitive care provided at FQHCs creates the ideal setting to collect and address SDH information.
**SDH screening tool.** The Protocol for Responding to and Assessing Patient Access, Risks, and Experiences (PRAPARE) Tool is an SDH screening mechanism that was developed by the National Association for Community Health Centers (NACHC) in 2015. The goal of the PRAPARE project was to implement/pilot test a national standardized patient risk assessment protocol to assess and address patients’ SDH (NACHC, 2015). As part of this effort, a meta-analysis of the existing evidence base and available risk assessment tools was conducted, which produced a core list of domains and questions for potential inclusion in PRAPARE. Following a two-year iterative process using expert panels, subject matter experts, and users in the field, a draft tool was piloted for both cognitive testing (do people understand the question and answer them in the way intended) and for ease of administration. The current tool is the byproduct of that two-year effort.

The 20-question PRAPARE tool (Appendix D {Spanish translation} and Appendix E {English translation}) was pilot tested at five different community health systems across the US. The PRAPARE tool includes questions across the social determinants’ spectrum: race, ethnicity, veteran status, farm worker status, English proficiency, income, insurance, neighborhood, housing status and stability, education, employment, material security, social isolation, stress, transportation, domestic violence, incarceration history, and refugee status. The aim of PRAPARE was to document patient/population complexity and to use that data to improve patient health, effect change at the population/community level, sustain resources and create community partnerships necessary to improve health.

**Impact of social determinants on health outcomes.** Below are explanations of current research that supports the connection between specific social determinants and the impact on health.
**Housing.** Homelessness is an independent risk factor for mortality (Morrison, 2009). People who experience homelessness die 20-30 years before their housed peers (Morrison, 2009). This population also suffers from higher rates of mental illness, addiction, and infectious diseases, like tuberculosis, HIV, and hepatitis, than their housed counterparts (Baggett & O’Connell, 2016). Homelessness can cause acute illness, and may exacerbate chronic illness due to the chaos associated therewith, including lack dependable access to food or shelter. High stress situations can exacerbate depression, anxiety, and alcohol dependence, especially when it is uncertain when or how the stress will end (Johnson & Chamberlain, 2011).

In addition, with lack of adequate shelter, environmental factors, such as exposure to extreme temperatures, can negatively impact breathing disorders like asthma (Wrezel, 2009). Mortality from respiratory illness is seven times greater in people experiencing homelessness when compared to the general population (Wrezel, 2009). Lack of access to a kitchen, refrigeration, or healthy meals makes it extremely difficult for homeless individuals’ to control diabetes. Lack of dietary control can cause hyperglycemia since soup kitchen meals are often high in carbohydrates. Alternatively, when there is no access to a meal or a refrigerator to store insulin, hypoglycemia results. In sum, homelessness can be a significant contributor to a person’s poor health.

**Education.** “Education has an enduring, consistent, and growing effect on health” (Mirowsky & Ross, 2003, p. 6). College graduates can expect to live at least five years longer than individuals who have not finished high school (RWJF, 2013). Having a college degree increases economic opportunity and people with higher incomes have additional resources to purchase healthy food, participate in routine physical exercise, and pay for health care. Low level of educational status is associated with increased rates of smoking, excessive alcohol intake,
obesity, drug use, teen pregnancy, and high-risk sexual behaviors (Feinstein, Sabates, Anderson, Sorhaindo, & Hammond, 2006).

The impact of education on health is further influenced by gaps in achievement by race. Black and Hispanic students are less likely than their White counterparts to graduate with either a high school or college diploma. They are also more likely to live in poor neighborhoods and have families with low incomes and no health insurance (Reeves, Rodrigue, & Kneebone, 2016). Though the connection between low education levels and poor health is clear, the solution is complex. Healthcare providers can play a unique role in advocating for patients to ensure school systems provide educational resources to meet students’ needs. Primary care pediatric providers are responsible for developmental and autism screening of children (Bright Futures Steering Committee, 2006). This creates opportunities to assist parents in obtaining individualized education plans, speech and language interventions, and behavioral modification plans.

**Social isolation.** Holt-Lunstad, Smith, Baker, Harris, and Stephenson (2015) published a meta-analysis evaluating the impact of social isolation on health. The analysis revealed social isolation, defined as reported loneliness, living alone, and lack of social integration in the community, increased the risk of early mortality. Socially isolated individuals were found to have a 29% increased risk for myocardial infarction and a 32% increased risk for stroke (Valtorta, Kanaan, Gilbody, Ronzi, & Hanratty, 2016). Social isolation can impair executive functioning, sleep as well as overall mental and physical wellbeing (Cacioppo & Cacioppo, 2014). Social isolation is a modifiable determinant, which means primary care providers can positively intervene with various strategies such as psychotherapy, referrals to senior centers, or outreach programming.
Environment. The Healthy People 2020 report (2010) explains that 25% of all deaths and the global disease burden worldwide is attributable to environmental factors. These factors are diverse and include exposure to unclean air, water, soil and food, natural disasters, nutritional deficiencies, and the built environment. A built environment includes man-made structures such as housing, which has the potential to exacerbate respiratory illnesses with damp walls or mold infestations. A meta-analysis conducted by Quanash, Jaakkola, Hugg, Sirpa, and Heikkinen (2012) revealed dampness and mold increase the risk of developing asthma. Two additional meta-analyses by Jaakkola (2012) and Fisk, Lei-Gomez, and Mendell (2007) report a 50% increase in respiratory symptoms, including cough, wheezing, and upper respiratory tract infections when exposed to dampness or mold in the home. Medical-legal partnerships have been an effective tactic in mitigating the negative affect of poor housing on health (Cohen et al., 2010). Medical-legal partnerships place legal professionals on healthcare teams to better address social causes of health disparities.

Diabetes. Inversely when we evaluate health outcomes, there can be indirect relationships identified with specific SDH. The American Diabetes Association (2017) defines diabetes as a disease in which the body’s ability to produce or respond to the insulin is impaired; resulting in abnormal elevated levels of glucose in the blood and urine. Hemoglobin A1C is a blood test used to diagnose diabetes that assesses blood sugar averages for the past 3 months (ADA, 2016). Diabetes is diagnosed at a Hemoglobin A1C of greater than or equal to 6.5%, pre-diabetes is 5.7-6.4%, and normal is less than 5.7%. For a person diagnosed with diabetes, the Hemoglobin A1C goal is less than 7% (ADA, 2017).

While diabetes is the seventh leading cause of death in the United States, nearly 80% of those diagnosed with diabetes have low or middle and middle socioeconomic status (CDC, 2014;
Lifestyle modifications, including dietary changes and exercise, are the focus of treatment for glycemic control (Selvin, Parrinello, Sacks, & Coresh, 2014). American Diabetes Association (2014) research has demonstrated that poor glycemic control is associated with poor outcomes such as reduction in risk of micro vascular complications and cardiovascular disease. Due to the nature of relying on lifestyle modifications for treatment, numerous SDH such as housing, income, and food insecurity could negatively impact an individual’s ability to make healthy changes and lead to higher Hemoglobin A1Cs. Though there is an indirect relationship between SDH and diabetes, there is a lack of evidence of a direct relationship between specific determinants and poor diabetes control (Walker et al., 2014).

**Hypertension.** Hypertension occurs when a person has abnormally high blood pressure. The American College of Cardiology, 2017, defines normal blood pressure as less than 120/80, hypertension stage I as a blood pressure of 130-139 or 80-89 mm Hg, and stage II as greater than or equal to 140/90 mm Hg. The American Heart Association (2017) reports that uncontrolled hypertension is a major risk factor in developing kidney disease, cardiovascular (heart attack), and cerebrovascular (stroke) disease.

Similar to diabetes, hypertension is influenced by a number of social factors. In addition, specific stressors in residential environments such as industrial, airport, and traffic noise, overcrowding, stress, and violence all show a positive association with blood pressure (Herbold, Hence, & Keil, 1989; Krantz, et al., 1987; Wilson, Kliwer, & Sica, 2004). Minorities have a higher prevalence of hypertension, which contributes to racial disparities in morbidity and mortality in the US (Redmond, Baer, & Hicks, 2011). It is unknown if the racial disparity is due to genetic factors or social factors, additional research is needed to better understand the direct impact of social determinants on blood pressure.
Evolving healthcare systems. In the following sections, changes in information technology, provider challenges, financial implications, and ethical considerations will be discussed regarding legislative and practice evolutions.

Information technology. Many healthcare providers are not systematically aware of patients’ barriers to care, which can greatly impact the effectiveness of treatment plans. The Patient Protection and Affordable Care Act (H.R.3590, 2009) and The Health Information Technology for Economic and Clinical Health Act (H.R.1, 2009) have been drivers of widespread implementation and utilization of meaningful use within the EHR. The goal of meaningful use is to improve quality, safety, and efficiency with the aim of reducing disparities and improving outcomes (HealthIT.gov, 2015). SDH data has traditionally been part of community or aggregate data and has been largely outside the healthcare setting (Institute of Medicine, 2014). Integrating SDH information into EHR nationwide could lead to an improved understanding about the relationship between SDH and health outcomes and is a natural progression of the technological advances made in the past 20 years. (McGinnis et al., 2002).

Provider challenges. Four out of five physicians surveyed by the Robert Wood Johnson Foundation (2011) said that patients’ social needs are as important to address as their medical conditions. This is especially true (95%) for physicians working in low-income, urban communities. In addition to recognizing the overwhelming social needs of their patients, 80% of physicians surveyed said they are not confident in their capacity to address their patients’ social needs (RWJF, 2011). This creates a significant gap in our current healthcare system. The combined; lack of SDH training, time with patients, and support staff contributes to providers feeling unequipped to deal with both the medical and social aspects of their patients’ lives.
Financial burden. Estimates suggest that the conditions for which patients seek medical care account for only about 10% of early deaths, whereas health behaviors and social conditions are estimated to account for more than 50% of deaths (McGinnis et al., 2002). Despite the fact that the US spends the highest amount per capita on healthcare expenditures compared to the Organization for Economic Cooperation and Development (OECD) countries, health outcomes in the US are persistently ranked the worst (OECD, 2015). More than 95% of the three trillion dollars the US spends on healthcare goes to direct medical care services, while just 5% is allocated to population-based approaches for health improvement (Centers for Medicare and Medicaid, 2014). Across all countries, those that had the highest ratio of spending on social services to spending on health care had the best population health statistics (Bradley et al., 2011). This suggests that increased investments in social services could lead to improved health outcomes in the US.

Having high quality, accessible medical care is important, but it is not the only solution to medical problems. According to the RWJF (2009), “The solutions to our health problems lie not principally in hospitals and doctors’ offices but in our homes, our schools, our workplaces, our playgrounds and parks, our grocery stores, sidewalks and streets, in the air we breathe and the water we drink” (p. 13). Over 95% of the trillion dollars spent on health care in the United States each year funds direct medical services, even though 60% of preventable deaths are caused by modifiable behaviors and community-based exposures (Alley et al., 2016).

Legal implications. Patients’ legal problems can also impact their overall health. The National Center for Medical Legal Partnership (2016) reports that med-legal partnerships have been growing across the country; currently, 155 hospitals and 139 health centers have developed such partnerships to help patients address their relevant legal needs. The topics range from denial
of benefits like disability or health insurance, poor housing conditions that are not up to code, seniors denied access to supportive services like long-term care, rights of lesbian, gay, bisexual, and transgendered persons, and immigration status. When working to address SDH, legal aid can be a key resource to advocate for and empower populations that often lack representation.

**Ethical considerations.** When viewing SDH from an ethical standpoint, Daniels (2002) explains, “we should view health inequalities that derive from social determinants as unjust unless the determinants are distributed in conformity with these robust principles” (p. 23). Healthcare disparities reflect our current policies, government, and healthcare structures, and inequities will persist as long as the current policies are perpetuated. Therefore, governments should pursue policies “aimed at equalizing individual life opportunities, such as investment in basic education, affordable housing, income security and other forms of antipoverty policy” (Bayer, 2007, p. 221).

Prior to implementing an SDH screening tool, an ethical determination should be made regarding the necessity of resources to address each SDH that could potentially be identified. For example, screening for domestic violence could be emotionally hurtful and further perpetuate a patient’s trauma if support resources are not made simultaneously available. It would be unethical and violate the nursing code of ethics principle non-maleficence to screen for SDH without also seeking to connect the patient to resources that could address the area of concern.

**Organizational Needs Assessment**

**Local demographics.** Federally Qualified Health Centers (FQHCs) are the country’s safety net and receive federal grant funding to provide services in underserved areas or to underserved populations. FQHCs offer a sliding fee scale, provide comprehensive medical services, implement quality assurance programs, and have a governing board of directors
Hope Healthcare (pseudonym) is a FQHC in the Washington, D.C. metro area and has served marginalized individuals for the past 30 years, providing services to over 100,000 patients across the lifespan annually, including special populations like people experiencing homelessness and inmates in the D.C. jail. In fact, 94% of Hope Healthcare patients are living below 200% of the poverty line and 10% are homeless (Health Resources and Services Administration, 2014).

Hope Healthcare has over 30 clinic sites, including community health centers, school-based health centers, homeless outreach centers, a mobile van clinic, and the jail infirmary. The majority of Hope Healthcare’s centers are in areas with the highest percentage of poverty, such as Wards 7 and 8 (Chandra, Blanchards, & Ruder, 2013). Washington, D.C. is a microcosm of the health disparities that exist within the US. Within the eight square miles of the District, there is a 12.7-year disparity in life expectancy between white and black residents (Robert Wood Johnson Foundation, 2009). In Wards 7 and 8, more than 93% of the Ward is Black and has more than 10 times the number of residents that live in poverty compared to Ward 3, which has only a 4.3% Black population (Chandra et al., 2013). SDH, like poverty, are widely recognized as barriers to care and contributors to overall health status, but Hope Healthcare has no formal system in place to identify or address SDH.

**Social services.** There is a social services department at Hope Healthcare and, with the patient centered medical home (PCMH) model, there is a social service provider assigned to each team. The social service providers are referred to as case managers. The Agency for Healthcare Research and Quality (2016) described the PCMH model as having the following attributes and functions: comprehensive care, patient-centered care, coordinated care, accessible services, quality, and safety. The partnership between healthcare providers and social workers is
invaluable, but Hope Healthcare has no standardized protocol for referring a patient to a case manager. If a patient articulates that they are having difficulty affording healthy foods, then it is possible to refer him or her to the case manager. However, it is problematic that care coordination with case managers occurs on an ad hoc basis and relies on the patient’s willingness to self-identify barriers to care. Such a system presents numerous challenges because it can be provider dependent whether the patient gets referred for additional services. Also, this requires some insight on the part of the patient. They may be unaware of how SDH like low literacy or unstable housing may be negatively impacting their health.

**Barriers and facilitators.** There is enthusiasm across all departments at Hope Healthcare for incorporating an SDH screening tool into the EHR, but deciding who on the care team will actually administer the tool has been challenging. There are numerous stakeholders, including, inter alia, the executive leadership, discipline directors, providers, medical assistants, and case managers. The pilot study done by NACHC recommends medical assistants administer the tool that screens patients and reported that the tool can be completed in an average of seven minutes. One of the most significant barriers to implementing the tool however, was found to be time. With scheduled 15-minute appointments, it is difficult for anyone on the team to add additional responsibilities to their list of necessary tasks within the allocated appointment times.

System level change will impact all aspects of the organization. The Lewin Change Theory will be utilized to help implement this change process. There are three parts of Lewin’s Model: unfreezing, change, and refreezing (Kritsonis, 2005). Unfreezing includes creating a sense of urgency, formulating a group to drive the change, and messaging across the organization. The change includes incorporating the tool into the EHR, providing education to the entire staff, and including the tool in the workflow. Refreezing involves sharing data with the
staff regarding outcomes, listening to staff feedback, and integrating the tool and associated processes into the culture of the organization.

**Impact of payment reform.** With imminent healthcare payment reform focused on quality and value, there are further incentives for implementing system-wide changes to include the gathering of additional patient data. Under the Affordable Care Act (Section 2703), the Health Home State Plan Option allows states to design health homes to specifically provide comprehensive care coordination and disease management for Medicaid beneficiaries with chronic conditions (Centers for Medicare and Medicaid, 2016). In Washington, D.C., Health Home I was initiated in 2014, which focused on individuals with severe and persistent mental illness. Health Home I aimed to improve coordination of care, decrease hospitalization rates, integrate behavioral and physical healthcare, and improve health outcomes (Washington, D.C. Department of Healthcare Finance, 2014). The second phase of Health Homes II, was renamed MyHealthGPS, and started July 1, 2017. MyHealthGPS incorporates comprehensive care coordination and disease management for Medicaid beneficiaries with two or more chronic conditions or one chronic condition in addition to chronic homelessness (Washington, D.C. Department of Finance, 2015).

There were 30,000 DC Medicaid patients who met the eligibility criteria for the care coordination program, i.e., suffer from two or more chronic conditions, or one chronic condition and historical chronic homelessness (i.e., matched to DC’s Permanent Supportive Housing (PSH) program). For the patients enrolled in the program, D.C. Medicaid pays $46-137 per patient per month to the participating organization (D.C. State Innovation Model, 2016). Hope Healthcare, the largest FQHC and the only healthcare for the homeless organization in the district, had majority of eligible patients at 13,000. In order to receive payment, the organization
demonstrates the following services have been rendered: comprehensive care management, care coordination, comprehensive transitional care/follow-up, patient and family support, and referral to community and social support. A major impetus for gathering SDH data is that, when organizations can prove their patient populations have a disproportionate need, they can qualify for increased federal grant reimbursement (42 USC 254b: 1996). The executive leadership at Hope Healthcare was motivated to implement SDH screening across the organization, especially in light of this payment reform.

**Organization assessment.** Schein’s cultural model (2010) was utilized to anticipate how Hope Healthcare will respond to a system wide change. Schein’s theory postulates that there are three levels to an organization’s culture: artifacts, values, and assumptions. Schein explains that artifacts are physical manifestations and representations of the underlying values of a group. The cultural values encompassing the second level include both espoused and attributed values. This level incorporates what the organization states as their values and what is attributed to them by employees. Lastly, the third level are an organization’s underlying shared basic assumptions that are at the core of an organization’s beliefs. Organizational assumptions are often taken for granted and there is little to no variation across the organization.

**Artifacts.** Hope Healthcare has the largest presence in Wards 7 & 8, which have the highest poverty rate in Washington, D.C. As a result of Hope Healthcare’s longstanding presence in these communities, its clinic sites alone are artifacts of the organization that symbolize a commitment to the underserved. The clinics serve as beacons of trust, caring, and compassion, where the needs of the most vulnerable patient populations are met. This reputation alone provides a strong foundation to help infuse change within the community.
Values. Espoused beliefs are those beliefs that the organization is founded upon. The stated values of Hope Healthcare are: listening, awareness, empathy, healing, respect, and accountability. The mission of the organization states, “Promoting healthier communities through compassion and comprehensive health and human services, regardless of ability to pay.” Hope Healthcare’s passion and commitment to the whole person and surrounding community is evident in its mission and practice. Its espoused beliefs are congruent with the organization’s actions and decisions.

Assumptions. When identifying underlying assumptions associated with patients, there is the belief that healthcare is a human right. Hope Healthcare makes decisions supported by a moral value that all people deserve high quality healthcare. There is a pervasive belief in social justice and the moral obligation to serve the impoverished and marginalized. The organization does not judge or blame its patients for their circumstances. Rather, there is a belief that poverty is complex, resulting, inter alia, from mental illness, institutionalized racism, and addiction.

By using Schein’s model (2010), it is evident that Hope Healthcare has a longstanding, deeply held belief system that has adapted to environmental changes over the last thirty years to meet the evolving needs of its patients. This evidence-based practice project was supported by a strong commitment to the underserved, trust within the community, leadership support, and financial incentives. Buy-in within the staff was key to the project’s success. Although initial staff feedback to the project’s concept has been overwhelmingly positive, the reality is that everyone already works exceptionally hard and can be overwhelmed with the current workload. It was important to demonstrate to the staff that this will not be just another task added to an already long list. The hope was that, by explaining how the data has potential to positively impact patients’ lives, the staff would be excited to implement this needed change.
Research Question (PICOT)

To establish the PICOT question, the first step was to identify an area of concern or knowledge-focused issue. Once the topic was identified, a question was developed. Asking the right question is essential for laying the groundwork for a successful project. The PICOT format is employed to structure the question; PICOT stands for patient/population, intervention, comparison, outcomes, and time (Newhouse, Dearholt, Poe, Pugh, & White, 2007).

Utilizing the PICOT format, the project question is as follows: what is the effect of providing clinical staff (Population) with an educational presentation about screening patients and addressing SDH (Intervention) using the PRAPARE tool (Outcome), and comparing tool responses to Hemoglobin A1cs and blood pressures across various health centers (Comparison) over a two-month period (Timing)? The clinical staff included the following providers: midwives, nurse practitioners, physicians, physician assistants, medical assistants, registered nurses, licensed registered nurses, social services staff (psychotherapists, social workers, and case managers).

Theoretical Framework

A conceptual framework for action on the social determinants of health. This project utilized the World Health Organization’s “A Conceptual Framework for Action on the Social Determinants of Health” (SDH; Appendix B; Solar & Irwin, 2007). The framework demonstrates how social, economic, and political domains produce specific socioeconomic positions for individuals and populations, which, in turn, have a significant impact on health status. Social status disparities can increase one’s vulnerability as well as the likelihood of negative health outcomes. When a person experiences low socioeconomic status, they are more likely to
experience various illnesses; these conditions can perpetuate unemployment and further feed into the cycle of poverty (Matthews, Gallo, & Taylor, 2010).

There are three components to WHO’s conceptual framework: socioeconomic/political context, socioeconomic position/social class, and intermediary determinants/social capitol, which demonstrate the three areas of SDH and how they collectively impact health status (Solar & Irwin, 2007). Socioeconomic and political contexts are broadly defined, referring to the overarching factors of society. Each country will have varying contexts, which have the potential to both positively, and negatively, impact individuals. For example, this component would include the economic stability of a country and its political context, such as capitalism or communism. Another example would be war, which may destabilize economic, educational, and employment opportunities. Socioeconomic position includes factors such as income, education, race/ethnicity, gender, sexuality, and occupation. Social capitol includes material circumstances, psychosocial factors, behaviors, sickness/disability, and access to healthcare. Solar and Irwin (2007) explain, “The unequal distribution of these intermediary factors (associated with differences in exposure and vulnerability to health-compromising conditions, as well as with differential consequences of ill-health) constitutes the primary mechanism through which socioeconomic position generates health inequities” (p. 40). This framework creates the context for the various levels of SDH and their impact on an individual’s health status.

**Framework for tackling social determinants of health inequities.** The second framework (Appendix C) that was employed was the “Framework for Tackling Social Determinants of Health Inequities” (Solar & Irwin, 2007). This framework demonstrates the necessity for multilevel interventions when aiming to decrease SDH inequities. Interventions can be done at the micro/individual level, the mesa/community level, or the macro/public policy
level. This framework was utilized in helping design this DNP project. The project focuses on creating impact on the micro and mesa levels by obtaining SDH information on an individual basis and pairing that with coordinated, team-based care focused on addressing those SDH barriers identified. Once aggregate data has been collected, work can begin on the mesa or organizational level to address inequities within the community.

Framework for educating health professionals to address social determinants of health. The Institute of Medicine developed the “Framework For Educating Health Professionals To Address Social Determinants of Health” (Appendix F; National Academies of Sciences, Engineering, and Medicine 2016). This is a theoretical framework that will be utilized during the education intervention with clinical staff. The framework incorporates three overarching elements: education, organization, and community. SDH are not widely integrated into healthcare professionals’ education (Frank et al., 2010).

At times, social justice lectures or community service experiences can serve as introductions to the topic. However, service without reflection and classroom education without community engagement can lead to a limited understanding of SDH’s complexities. Medical and nursing education about healthcare disparities focuses primarily on disparities within the healthcare system and does not always integrate the larger social and political contexts (Cené, Peek, Jacobs, & Horowitz, 2010). The IOM education model attempts to address this gap by incorporating experiential learning, collaborative learning, an integrated curriculum, and continuing professional development (National Academies of Sciences, Engineering, and Medicine, 2016).
Evidence Based Practice Model

Evidence based practice (EBP) is an approach to healthcare that seeks to utilize the best evidence possible. The EBP model (Appendix G) has been employed for this project and helps to provide a guide for evaluating research evidence to improve patient care. The Iowa model focuses on organization and collaboration to identify knowledge and problem triggers, which lead staff to question current practice and critically evaluate possible solutions (Doody & Doody, 2011).

Each of the seven steps of the Iowa model will be explained with current project details.

Selection of topic. Direct clinical care accounts for only 10-15% of a person’s health status and the remaining 90% percent is comprised of SDH (Booske, Athens, Kindig, Park, & Remington, 2010; Robert Wood Johnson Foundation, 2009). Our clinical efforts are addressing a small portion of a person’s overall health status. This leaves a wide gap for practice change.

Forming a team. In addition to a faculty mentor, the organization’s SDH quality improvement team is made up of multidisciplinary members, including a subject matter expert, IT staff, medical directors, chief medical officer, director of social services, and a health center director. With a system level change, leadership from each clinical, registration, and social service department is essential.

Evidence retrieval. In this phase, a comprehensive literature review was completed.

Grading the evidence. Each of the 11 articles was evaluated using the Melnyk model to grade the level of evidence.

Developing an EBP standard. This project created an EBP standard for SDH knowledge amongst clinical staff, improved comfort addressing SDH, and adapted a work flow incorporating SDH screening during clinical practice in primary care.
Implementing the EBP. An educational presentation was utilized to do a team based SDH and healthcare disparities training, which was followed by the implementation of a standard operating procedure for the annual SDH screening of all adults 18 years of age and older.

Evaluation. Reports were made on a monthly basis to evaluate the number of patients screened. A quarterly report evaluated the aggregate data and identified the most common SDH barriers to care. The SDH data was also be compared with clinical data.

Definition of Terms

1. Social determinants of health: “The social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries” (World Health Organization, 2016, para. 1).

2. Screening: “The systematic application of a test or inquiry, to identify individuals at sufficient risk of a specific disorder to warrant further investigation or direct preventive action amongst persons who have not sought medical attention on account of symptoms of that disorder ” (Gray, 1998, p. 12.). This is operationalized through the use of the PREPARE tool.

3. Health disparities: “Health disparities are systematic, plausibly avoidable health differences according to race/ethnicity, skin color, religion, or nationality; socioeconomic resources or position (reflected by, e.g., income, wealth, education, or occupation); gender, sexual orientation, gender identity; age, geography, disability, illness, political or other affiliation; or other characteristics associated with discrimination or
marginalization. These categories reflect social advantage or disadvantage when they determine the position of an individual or group in a social hierarchy” (Braverman, et al., 2011, p. S150).

4. Data team: The data team at Hope Healthcare is a subset of the informatics department, which includes three staff who are trained as information technology data analysts. This team extracts data from the EHR and creates reports for the organization.

In summary, healthcare disparities are persistent in the US, with SDH contributing to this chasm. Providers identify the importance of social need, but feel ill equipped to address SDH issues currently. There is growing momentum to screen for and address SDH in primary care settings, but such processes are still not routine. In the next chapter a comprehensive literature review will be detailed along with the grading of the evidence.
Chapter II
Review of Literature

Introduction to Search Criteria

A comprehensive search of the literature was performed using the following databases: Cochrane, Embase, CINAHL, PubMed, Ovid, and Proquest. A senior librarian and senior clinical informationist from Georgetown Dahlgren Library were consulted. Due to the allocation of resources for social health systems, universal healthcare programs, and social research the European database Embase was utilized. The following search terms were used: screening, social determinants of health, social determinants of health screening, screening tools for social determinants of health, screening for socioeconomic factors of health, healthcare disparities screening, social determinants of health screening and diabetes, health inequalities screening and diabetes. Boolean operators such as AND and OR were used to connect the terms social determinants of health and screening as well as the terms screening and healthcare disparities. Each of these words or terms was used in each of the databases.

Inclusion criteria included articles from 2007-2016, full text, English language, research that screened for SDH generally, primary research, or systematic review and screening that was done within the healthcare setting. Exclusion criteria included studies that were not in English, studies that examined only one component of SDH, like housing status or food security, screenings that were conducted outside of the healthcare setting and secondary research. This yielded 11 research articles that met the inclusion criteria. The studies were then evaluated using the Melnyk model to critically appraise them and then each article was assigned a level depending on the level of evidence. Of the 11 studies there were two expert opinion papers

The systematic review done by Walker et al., (2014) focused on the impact of SDH on type 2 diabetes outcomes, but there were no systematic review studies that focused on SDH screening. The review utilized articles which included at least one of three health outcomes measures: Hemoglobin A1C, blood pressure, or serum cholesterol. Based on the 61 studies evaluated, SDH impacted glycemic control, LDL, and blood pressure to varying degrees. Individuals with lower socioeconomic status were more likely to have higher Hemoglobin A1c. Higher Hemoglobin A1C was associated with poor health literacy, race, depressive symptoms, and social isolation, but the associations were not consistent across all 61 studies. Current research lacks information needed to better understand the direct relationship between addressing SDH and overall health outcomes (Walker et al., 2014).

**Critique and Synthesis of Previous Evidence**

The literature search was comprehensive, crossing medical, public health, epidemiology, and medical research databases and produced 11 articles that met the inclusion criteria. This quickly revealed that there is a lack of literature on the topic of SDH screening. At the time of the literature review, there were no validated SDH screening tools identified. However, in two of the studies, the WE CARE tool (not validated) was utilized but it was by the same researcher, Dr. Garg (2007, 2015). The other studies either developed their own screening tool or used multiple
tools, but there was no screening tool consistency used. Additionally, there was wide variation in the methods of administering the screening tools. There were paper self-reported studies (Brcic et al., 2011; Garg et al., 2009; Garg et al., 2015), face-to-face interviews (Gottlieb et al., 2014; Page-Reeves et al., 2016), web-based remote questionnaires (Hassan et al., 2015), and electronic screening (Gottlieb et al., 2014).

Within the articles reviewed, three themes emerged. First, integrating SDH screening into healthcare is important, but how to do it, which tool to use, and who will administer the tool was unclear. Secondly, providers felt that social needs are equally as important to address as medical conditions, but more training is needed to do so. Finally, with few studies found in this area, additional research is needed including more randomized control studies, studies with greater variance in healthcare settings, and specific studies that link screening to health outcomes.

**Integrating SDH screening into healthcare settings.** Five of the studies demonstrated the feasibility of incorporating SDH screenings into three different healthcare settings: emergency department, pediatric primary care clinics, and family medicine clinics (Garg et al., 2015; Garg et al., 2009; Garg, et al., 2007; Gotlieb et al., 2014; Page-Reeves et al., 2016). This is an important finding because despite expert opinions suggesting that integrating SDH screening into primary care is essential in improving health outcomes, it is not routinely done and feasibility is a barrier (Gottlieb, Sandel, & Adler 2013).

There are numerous barriers to collecting and addressing SDH data in healthcare settings, but a major issue appears to be time constraints. Primary care visits can be as short as 15 minutes and determining when to administer the tool during such quick visits can be a challenge (Reeves et al., 2016). The studies varied as to the timing of screenings, with self-administration in waiting rooms, in patient rooms, or in person with a medical assistant, research assistant, or provider
Providers may already feel overwhelmed by the social complexity of their patients’ needs and a screening tool could add strain by revealing additional concerns (Page-Reeves et al., 2016). An ethical dilemma arises when SDH screening identifies a need, but there are no available resources to address that need (Garb et al., 2007). It is therefore imperative to only screen for issues an organization can either address directly or otherwise refer out to service agencies. A team approach can help ensure adequate coordination of care. Integrating either a mental health clinician, community health worker, or social worker into a primary care team helps to connect patients with identified additional needs to much needed services (Bair-Merritt, 2015; Garg & Dworkin, 2011; Page-Reeves et al., 2016).

**SDH training for medical staff.** As highlighted in the Robert Wood Johnson Foundation 2011 report “Healthcare’s Blind Side” four out of five primary care physicians said social needs are as important to address as medical conditions. However, they do not feel confident in their ability to address those needs, and their patients’ health may suffer as a result. Some studies provided medical students with an opportunity to learn how to, and practice, discussing difficult topics with their patients (Garg et al., 2009; Page-Reeves et al., 2016). Incorporating psychosocial needs into resident training has potential long-term benefits since experiential learning is more likely to be incorporated into practice long-term (Garg et al., 2009). Bari-Merritt et al. (2015) revealed expert opinion that additional training as a healthcare team (medical assistants, front desk staff, social workers, providers) to address psychosocial adversity and social competence is necessary to eliminate healthcare disparities. Unfortunately, there were no articles about SDH training identified that were specific to nurses or advanced practice nurse
education. Garg and Dworkin (2011) suggest that professional medical organizations could play an important role of improving care and promoting ongoing education regarding the importance of SDH on overall health outcomes.

**Further Research**

In each study reviewed, the need for additional research was stressed across all aspects of the field. Studies’ current limitations included small sample sizes, lack of randomization, lack of validated tools, and lack of direct correlation between social determinants and health outcomes. More randomized control trials are necessary to add to the currently limited knowledge on the topic. A validated standardized SDH tool is imperative when comparing research outcomes (Bair-Merritt et al., 2015). The Protocol for Responding to and Assessing Patient Assets Risks and Experiences (PRAPARE) tool has been used and piloted by the National Association for Community Health Centers (NACHC), but their work has not yet been published. The hope is that the PRAPARE tool can be standardized across primary care settings, though the tool has its limitations since it has only been utilized with adults. Additional evidence is needed to better understand the most effective referral system, the best platform for SDH screening, and the most effective education strategies for healthcare staff (Bair-Merritt et al., 2015; Garg & Dworkin, 2011; Gottlieb et al., 2014). In order to better understand these relationships, longitudinal studies are necessary.

**Rationale for Project**

From a review of the current literature, it is evident there is a significant lack of systematic reviews and high quality randomized control studies, a limited volume of completed studies, and a limited consistency of tools used and findings shared. Additional research is needed in SDH screening to evaluate the effectiveness of training, the use of the tool, and to
compare the screening results to health outcomes. By implementing SDH screening at Hope Healthcare, the project integrated the PRAPARE tool into clinical practice by educating providers, and used the screening tool data for comparison to health outcomes like blood pressure and blood sugar. Evaluating the correlation of SDH with blood pressure and hemoglobin A1C builds off the work of Walker et al., (2014) with the hope of adding additional information to an area with a dearth of research. Using the Framework for Tackling SDH, this project was implemented on the micro level by integrating SDH into an EHR allowing providers to tailor treatment to meet patient needs. On the mesa level, the PRAPARE tool facilitated referrals to needed resources, and provided information about the patient population to aid the development of new programing. In the future the information gathered via screening can be used on the macro level to inform advocacy for policy change at the city and state levels. The ultimate goal is to close the healthcare disparities’ chasm that currently exists and by integrating SDH screening into primary care, progress towards this broad goal can begin on an individual basis.
Chapter III

Methods

Design Framework and Plan

This project is a mixed method descriptive study that evaluated the effects of an education intervention about SDH and the results of SDH screening in a primary care setting. The three aims included: (a) assess an education intervention regarding Social Determinants of Health (SDH) on clinical staff, (b) integrate and evaluate a SDH screening tool called PRAPARE into clinical practice, (c) describe the findings of patients who were screened. A multidisciplinary clinical group received training about SDH, healthcare disparities, screening for SDH, and integration of the PRAPARE tool into clinical practice. The staff was sent an electronic survey following the education intervention evaluating the training. Responses to the survey were voluntary and consent was obtained. After the training, the staff screened a convenience sample of adult patients 18 years of age and older for 12 weeks in a primary care setting at a FQHC. After 12 weeks of screening, the staff received a second survey evaluating their experience with the PRAPARE tool. Participation in the surveys was optional for the clinical staff and was not a part of their required job duties. The data team at Hope Healthcare extracted the screening results from the EHR and assembled an excel spreadsheet with the responses to the PRAPARE tool. See Appendix K for a Gantt chart reflecting procedures and timeline.

Training. The education intervention provided to clinical staff occurred at three different Hope Healthcare community health centers. The training was voluntary and individuals were given the option to participate. Though the training occurred in three locations, the staff rotates
across different sites, thus the screening occurred in a total of four Hope Healthcare FQHCs. The IOM (2016) Framework For Educating Health Professionals To Address Social Determinants of Health was utilized in designing the education presentation. There was a 60-minute team-based training developed and presented by the principal investigator at each site to a multidisciplinary clinical staff. The education followed the principles of the framework, which included experiential, integrated, and collaborative learning across the learning continuum. Appendix H contains an outline of the training content provided to the clinical staff.

The goals of the training included the following:

1. Expand understanding of how social determinants of health affect health outcomes;
2. Increase knowledge about the social determinants of health PRAPARE screening tool;
3. Explain new work flow to incorporate PRAPARE tool into clinical practice;
4. Familiarize staff with Hope Healthcare and community resources to address social determinants of health, and
5. Increase participant comfort when addressing social determinants of health.

**Implementing the PRAPARE tool.** The PRAPARE tool was used with permission from NACHC (Appendix L-3) and was embedded within eClinicalWorks, the EHR that is utilized across all of the Hope Healthcare sites. When a patient presented to one of the FQHCs for an appointment with their medical provider, a medical assistant or case manager delivered the script explaining the purpose of the PRAPARE tool and of the screening. Patients had the ability to decline the screening, or to refuse to answer specific questions found on the tool. A laminated copy of the tool was available in English and Spanish (Appendix D and F). When the patient agreed to participate, the laminated sheet was given to the patient with a dry erase marker to complete the screening tool independently. If a patient was illiterate, or did not read and write in
any of the available languages, the medical assistant or case manager utilized the language line to access certified interpretive services to assist with completing the screening tool. Once completed, the medical assistants inputted the results into the EHR. The information was saved in the patients’ medical record and will be available for all future medical and social service appointments.

**Project Sponsor/Resources**

Hope Healthcare was the primary sponsor, as the project was carried out across different sites and involved clinical staff. Interdisciplinary teamwork was the cornerstone of this project as it impacts the medical, nursing, and social service departments. The directors of each of the departments were essential sponsors of the project. Additional technical support was utilized from the IT department to assist with EHR configuration. In addition, the data team helped produce the data reports.

**Investment and Business Plan**

There were upfront costs with the project including the EHR configuration and staff training, but the projected long term savings and revenue have the potential to be significant. The EHR configuration had a one-time cost of about $1000 paid by Hope Healthcare to eClinicalWorks. The principal investigator conducted the education intervention over the 60-minute lunch break to mitigate any interruptions to patient care. Hope Healthcare has over 10,000 patients identified by DC Medicaid to participate in the payment reform effort MyHealthGPS. Eligible patients, for whom Hope Healthcare can enroll, has potential to generate $47/patient/month reimbursement that could result in $5.6 million revenue annually. MyHealthGPS was not evaluated as part of this project, but there is potential for the organization to continue to adapt PRAPARE organization wide. The PRAPARE tool was implemented as a
smart form in the EHR that will have the capacity to suggest ICD10 codes and additional CPT codes that can track actions taken, such as referrals. With care coordination being the key to meeting the requirements for payment, having the PRAPARE tool within the EHR provides a trackable record of care coordination.

**Human Subjects Review**

The Hope Healthcare executive management team approved the study prior to implementation of the project. The executive management team includes the vice president of operations, chief medical director, deputy medical director, director of clinical research, director of nursing, and director of social services. Protection of Human Subjects training was completed by the principal investigator and approval to conduct the project was obtained by the Georgetown Institutional Review Board (IRB). With the education intervention being optional, consent was implied. For the two surveys that were completed via Survey Monkey, the first page was informed consent stating that their participation was voluntary and if they decided not to participate their would be no negative ramifications, and by proceeding to the survey consent was implied.

Due to the nature of the project, the organization was aware of the potential for risks to the patients including distress or loss of confidentiality. Knowing that it can be distressing to discuss personal information and lack of resources, it is of the utmost importance to support patients and offer additional services as needed. Patients were also made aware that they could decline the screening. To ensure patient privacy, the principal investigator received reports from the data team that were de-identified.

The nursing code of ethics was evaluated for this project and the principles of beneficence, nonmaleficence, autonomy, and justice were carefully considered. Beneficence
captures the importance of the study having a benefit to the patient. By screening for SDH the aim is to provide resources to meet the identified needs. Nonmaleficence aims to have no harm to the patient or the least harm possible. Having a script prior to the administration of the screening serves to inform the patient that the goal is to better understand their needs in an attempt to provide resources for them. By prefacing the screening the hope is that patients will not experience any distress in revealing personal information. Autonomy is allowing patients to make decisions for themselves, which includes declining participation. All patients had the opportunity to decline the screening in its entirety or to decline answering specific questions if they were uncomfortable. Justice ensures that all participants are assessed without prejudice and offered resources to meet their unique needs.

**Population**

There were two populations for this project: Hope Healthcare staff and patients. Three teams in various locations received training on SDH, health disparities, SDH screening, and the new workflow. The staff included primary care providers (physicians, nurse practitioners), social services staff (case managers), nursing staff (medical assistants, registered nurses, license practical nurses), and support staff (registration clerks, and care management support).

The patient population included in the study were adult Hope Healthcare patients 18 years of age and older. With the vast majority of the PRAPARE screening occurring at two different sites, a descriptive analysis was completed to evaluate the differences in SDH at each of the two sites.

**Procedures – Timeline**

The PRAPARE tool was configured into the EHR eClinicalWorks January 2017 as part of MyHealthGPS preparation, thus it was ready for use after training was completed with staff.
Two trainings with clinical staff were completed in April, and the third training was completed in May. Post-education surveys were sent via email immediately following the training, and participants were given two weeks to complete the survey. A reminder email was sent one week into the two-week period and then on the last day. The PRAPARE tool screening occurred for 12 weeks after the education intervention. After the 12-week period, the second survey was sent to clinical staff participants and they had two weeks to complete the survey. A reminder email was set one week into the two-week period and then on the last day. The Hope Healthcare data team extracted the data from the PRAPARE responses within the EHR in October 2017 and made the de-identified data available to the principle investigator.

**Study Instruments**

**PRAPARE.** The PRAPARE tool was utilized for SDH screening. The tool was developed by NACHC in 2014, and is the only validated comprehensive SDH screening tool. The complete PRAPARE tool includes 20 questions, but the demographic data including race, ethnicity, income, veteran status, and insurance status were extracted via registration data, and left off the screening tool given to the patients. Subsequently there were 13 PRAPARE questions employed on the handout. After the tool has been completed, a total score is tallied. For example, not having housing would earn one point and having less than a high school education would earn another point. Thus, higher scores indicate more barriers to care have been identified by the patient.

In conjunction with the data team at Hope Healthcare, all the responses to the PRAPARE tool were extracted and collected as raw aggregate data from the EHR. All patient identifiers were removed from the reports and each patient was assigned a unique identifier. No protected
patient information was moved from Hope Healthcare password protected computers. Data were shared with a statistician and faculty advisor via Georgetown Box.

**Education survey.** An evaluation of training survey, developed by principal investigator in conjunction with two faculty mentors and one subject matter expert, was administered to clinical staff. The optional survey was emailed via Survey Monkey to all of the staff participants immediately following the training. The survey included six Likert-type 5-point scale questions with responses ranging from poor to excellent. These six questions were designed to evaluate how well the presentation met stated goals, which included rating the quality of the presentation, the handouts, and comfort utilizing the PRAPARE tool. The second half of the survey included three Likert-type questions on the same 5-point scale, which were used to measure how well the learner felt they met their education goals. Finally, the last part of the survey had three open ended questions asking the learner what they liked least and most about the training and how the presentation could be improved. A copy of the first clinical staff evaluation of training survey can be found in Appendix I.

**Post-PRAPARE implementation survey.** At the end of the 12-week screening period a second optional survey was sent out via Survey Monkey to the learners. The survey was developed in conjunction with two faculty mentors and a subject matter expert. The survey included nine questions. The first two questions were for demographic information including age and role within the health center. The third question asked if the person received the training, and the fourth question asked the person what percentage of their patients they are screening using the PRAPRE tool. Within question five, there are nine Likert-like questions using a five-point scale from strongly agree to strongly disagree. These questions evaluated the usability of the PRAPARE tool, provider’s comfort discussing SDH, and knowledge about resources available to
address SDH. Question six had participants estimate what percentage of patients has experienced each of the SDH. The last question was open ended and asked participants to share their thought about the PRAPARE tool. A copy of the PRAPARE implementation survey can be found in Appendix J.

**Outcome Measurements and Data Analysis Plan**

The PRAPARE tool responses collected were extracted from the EHR by the Hope Data Team and placed into Excel spreadsheets. Analysis of the data was conducted using Microsoft® Excel® and IBM® SPSS® 24 software under the direction of a statistician. Each survey was evaluated independently using descriptive analysis. Analysis was completed on each question of the PRAPARE tool. The majority of the patients screened were at two different sites, thus there was question level descriptive analysis and comparative analysis between the two sites. The Chi-square test was utilized to compare the categorical data from the PRAPARE questions from each of the sites. Independent samples \( t \) test was used to compare continuous data (e.g., blood pressure and Hemoglobin A1c) about patients at the two sites.

To evaluate correlation between SDH and clinical outcomes two clinical data points were also included in the report: the blood pressure at the time of the visit, and a Hemoglobin A1c, if one was done in the past three months. A Pearson’s Correlation was used to evaluate the relationship between the PRAPARE score, and two clinical outcomes: blood pressure and hemoglobin A1c. Once the PRAPARE tool was completed, there is a tallied score that is a reflection of a person’s SDH barrier; the higher the score, the more barriers identified. The null hypothesis is that there is no relationship between PRAPARE score and blood pressure and hemoglobin A1c.
Both clinical staff surveys were also analyzed using descriptive statistics. The Post-PRAPARE Implementation Survey question six, which asks participants to estimate what percentage of the patients screened during the 12-week period experienced each of the SDH. The clinical staff responses were compared to the PRAPARE data to evaluate the staff’s comprehension of their patient’s challenges. Appendix L contains the permission to reproduce consent documents that were used in this study (L-O).
Chapter IV

Results

The results analyzed were a reflection of the purpose of the project. The three aims included: (a) assess an education intervention regarding Social Determinants of Health (SDH) on clinical staff, (b) integrate and evaluate a SDH screening tool PRAPARE in clinical practice, and (c) describe the findings of patients who were screened. In this section the PRAPARE screening and survey results will be analyzed. There were 222 patients screened utilizing the PRAPARE tool. Of the 45 staff that received the education intervention, there were 15 staff who completed the post-education survey, and 15 staff who completed the second survey evaluating the implementation of the PRAPARE tool. The staff surveys were anonymous thus it is uncertain if the same 15 people completed both surveys.

Survey Results

Of the 15 participants that completed surveys their characteristics are summarized in Table 1

*Characteristics of Survey Participants.*

<table>
<thead>
<tr>
<th>Role</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Assistant</td>
<td>4</td>
<td>26.7</td>
</tr>
<tr>
<td>Nurse Practitioner</td>
<td>2</td>
<td>13.3</td>
</tr>
<tr>
<td>Physician</td>
<td>7</td>
<td>46.7</td>
</tr>
<tr>
<td>RN/LPN</td>
<td>2</td>
<td>13.3</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 to 34</td>
<td>5</td>
<td>33.3</td>
</tr>
<tr>
<td>35 to 44</td>
<td>4</td>
<td>26.7</td>
</tr>
<tr>
<td>44 to 54</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>55 to 64</td>
<td>4</td>
<td>26.7</td>
</tr>
<tr>
<td>65 to 74</td>
<td>2</td>
<td>13.3</td>
</tr>
</tbody>
</table>
Training participants were asked to rate various aspects of the training on a 5-point Likert scale, with responses ranging from 1 = Poor to 5 = Excellent. Results of the evaluation are presented in Table 2. Participants rated the training highly, with no ratings on the low end of the scale. Nonetheless, participants expressed some concern with their comfort in being able to integrate the PRAPARE tool into their practice and their comfort in utilizing the tool. Both of these items received a high percentage of scores of 3 – a neutral score.

Table 2

*Rating of Training. (n = 15)*

<table>
<thead>
<tr>
<th></th>
<th>Poor (1)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Excellent (5)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>(SD)</td>
</tr>
<tr>
<td>Met educational goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20.0</td>
<td>80.0</td>
</tr>
<tr>
<td>Quality of presenter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.7</td>
<td>93.3</td>
</tr>
<tr>
<td>Usefulness of written materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.3</td>
<td>46.7</td>
</tr>
<tr>
<td>Practical value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.7</td>
<td>33.3</td>
</tr>
<tr>
<td>Explained PRAPARE tool</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40.0</td>
<td>60.0</td>
</tr>
<tr>
<td>Comfort integrating PRAPARE tool</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>46.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Understanding of SDH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20.0</td>
<td>40.0</td>
</tr>
<tr>
<td>SDH impact on health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.3</td>
<td>40.0</td>
</tr>
<tr>
<td>Comfort utilizing PRAPARE tool</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33.3</td>
<td>46.7</td>
</tr>
</tbody>
</table>

After using the PRAPARE tool, participants responded to a survey about their experiences. Results of their responses are found in Table 3. Although participants had 12 weeks to put the PRAPARE tool into practice, the majority of them did not use it regularly. Sixty percent said they used it with 10% or fewer of their patients, 20% said they used it with a quarter
of their patients, and 20% with 90% of their patients. Reasons given for inconsistent use of the tool was indicated in the open-ended questions on the survey and the majority of respondents indicated that lack of time was the biggest factor. The other factor identified was a lack of support staff, which can either make it difficult to complete, or lack of social work staff to address issues identified.

Table 3

Rating of Experience Using PRAPARE. (n = 15)

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td></td>
</tr>
<tr>
<td>Easy to Use</td>
<td>0</td>
<td>6.7</td>
<td>6.7</td>
<td>66.7</td>
<td>20.0</td>
<td>4.00 (0.76)</td>
</tr>
<tr>
<td>Workflow Clearly Defined</td>
<td>0</td>
<td>0</td>
<td>20.0</td>
<td>66.7</td>
<td>13.3</td>
<td>3.93 (0.59)</td>
</tr>
<tr>
<td>Helps Assess SDH</td>
<td>0</td>
<td>0</td>
<td>13.3</td>
<td>66.7</td>
<td>20.0</td>
<td>4.07 (0.59)</td>
</tr>
<tr>
<td>More Likely to Refer to Social Services</td>
<td>0</td>
<td>6.7</td>
<td>20.0</td>
<td>40.0</td>
<td>33.3</td>
<td>4.00 (0.93)</td>
</tr>
<tr>
<td>Well-informed about Resources</td>
<td>0</td>
<td>6.7</td>
<td>33.3</td>
<td>40.0</td>
<td>20.0</td>
<td>3.73 (0.88)</td>
</tr>
<tr>
<td>Addressing social needs is as important as addressing medical needs</td>
<td>0</td>
<td>6.7</td>
<td>0</td>
<td>46.7</td>
<td>46.7</td>
<td>4.33 (0.82)</td>
</tr>
<tr>
<td>Comfortable talking with patients about SDH</td>
<td>0</td>
<td>6.7</td>
<td>13.3</td>
<td>40.0</td>
<td>40.0</td>
<td>4.13 (0.92)</td>
</tr>
<tr>
<td>Patients frequently express health concerns caused by unmet social needs</td>
<td>0</td>
<td>6.7</td>
<td>26.7</td>
<td>53.3</td>
<td>13.3</td>
<td>3.73 (0.80)</td>
</tr>
<tr>
<td>I understand how SDH impacts health</td>
<td>0</td>
<td>0</td>
<td>6.7</td>
<td>53.3</td>
<td>40.0</td>
<td>4.33 (0.62)</td>
</tr>
</tbody>
</table>

Participants were asked to estimate the percentage of their patients with various unmet social needs. Their responses are summarized in Table 4.
Table 4

*Estimation of Unmet Social Needs.*

<table>
<thead>
<tr>
<th></th>
<th>0%-20%</th>
<th>21%-40%</th>
<th>41%-60%</th>
<th>61%-80%</th>
<th>81%-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of Housing</td>
<td>53.3</td>
<td>6.7</td>
<td>20.0</td>
<td>13.3</td>
<td>6.7</td>
</tr>
<tr>
<td>Lack of Education</td>
<td>13.3</td>
<td>20.0</td>
<td>20.0</td>
<td>46.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Lack of Employment</td>
<td>20.0</td>
<td>6.7</td>
<td>20.0</td>
<td>33.3</td>
<td>20.0</td>
</tr>
<tr>
<td>Lack of Financial Resources</td>
<td>13.3</td>
<td>33.3</td>
<td>20.0</td>
<td>20.0</td>
<td>13.3</td>
</tr>
<tr>
<td>Lack of Transportation</td>
<td>26.7</td>
<td>26.7</td>
<td>26.7</td>
<td>20.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Social Isolation</td>
<td>33.3</td>
<td>33.3</td>
<td>20.0</td>
<td>13.3</td>
<td>0.0</td>
</tr>
<tr>
<td>High Stress</td>
<td>13.3</td>
<td>6.7</td>
<td>33.3</td>
<td>26.7</td>
<td>13.3</td>
</tr>
<tr>
<td>Incarceration</td>
<td>53.3</td>
<td>26.7</td>
<td>6.7</td>
<td>6.7</td>
<td>0</td>
</tr>
<tr>
<td>Refugee Status</td>
<td>26.7</td>
<td>20.0</td>
<td>13.3</td>
<td>20.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Domestic Violence</td>
<td>73.3</td>
<td>20.0</td>
<td>0.0</td>
<td>6.7</td>
<td>0.0</td>
</tr>
</tbody>
</table>

When analyzing what the staff identified as social needs, compared to what patients identified on the PRAPARE tool, there were large discrepancies. In particular lack of housing and lack of employment were underestimated. High stress, incarceration, refugee status, and domestic violence were highly overestimated.

**Demographic Data**

Records from 222 patients at 4 facilities were examined. Table 5 describes the characteristics of these patients by facility.
Table 5

*Patient Characteristics by Facility.*

<table>
<thead>
<tr>
<th></th>
<th>A (n = 123)</th>
<th>B (n = 77)</th>
<th>C (n = 3)</th>
<th>D (n = 19)</th>
<th>Total (n = 222)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (M, SD)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>55.2 (9.3)</td>
<td>50.4 (16.0)</td>
<td>45.3 (9.1)</td>
<td>54.8 (11.5)</td>
<td>53.4 (12.4)</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>110 (89.4)</td>
<td>32 (41.6)</td>
<td>3 (100)</td>
<td>19 (100)</td>
<td>164 (73.9)</td>
</tr>
<tr>
<td>White</td>
<td>10 (8.1)</td>
<td>1 (1.3)</td>
<td>0</td>
<td>0</td>
<td>11 (5.0)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (1.6)</td>
<td>5 (6.5)</td>
<td>0</td>
<td>0</td>
<td>7 (3.1)</td>
</tr>
<tr>
<td>Missing*</td>
<td>1 (0.8)</td>
<td>39 (50.6)</td>
<td>0</td>
<td>0</td>
<td>40 (18.0)</td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>120 (97.6)</td>
<td>34 (44.2)</td>
<td>3 (100)</td>
<td>17 (89.5)</td>
<td>174 (78.4)</td>
</tr>
<tr>
<td>Spanish</td>
<td>1 (0.8)</td>
<td>39 (50.6)</td>
<td>0</td>
<td>2 (10.5)</td>
<td>40 (18.0)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (1.6)</td>
<td>4 (5.2)</td>
<td>0</td>
<td>0</td>
<td>8 (3.6)</td>
</tr>
<tr>
<td><strong>Poverty Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 100%</td>
<td>104 (84.6)</td>
<td>56 (72.7)</td>
<td>2 (66.7)</td>
<td>13 (68.4)</td>
<td>175 (78.8)</td>
</tr>
<tr>
<td>101-150%</td>
<td>8 (6.5)</td>
<td>10 (13.0)</td>
<td>1 (33.3)</td>
<td>1 (5.3)</td>
<td>20 (9.0)</td>
</tr>
<tr>
<td>151-200%</td>
<td>3 (2.4)</td>
<td>4 (5.2)</td>
<td>0</td>
<td>3 (15.8)</td>
<td>10 (4.5)</td>
</tr>
<tr>
<td>Over 200%</td>
<td>6 (4.9)</td>
<td>7 (9.1)</td>
<td>0</td>
<td>1 (5.3)</td>
<td>14 (6.3)</td>
</tr>
<tr>
<td>Missing</td>
<td>2 (1.6)</td>
<td>0</td>
<td>0</td>
<td>1 (5.3)</td>
<td>3 (1.4)</td>
</tr>
</tbody>
</table>

When comparing patient characteristics Clinic C was ultimately not included because only records for three patients were available. Using a one-way ANOVA, it was found that age was statistically different by facility, $F(2, 216) = 3.687, p = .027$. Post hoc testing using Games Howell found that patients at Clinic B were significantly younger than patients at Clinics A and D. Clinic D utilized the tool specifically to evaluate for food insecurity for a different purpose, thus many of the screening tool was left blank and was unable to be compared to the other sites.

Chi squared tests of independence were used to compare patient characteristics among facilities (not including Clinic C which had only 3 patients). There was a statistically significant difference in racial/ethnic makeup of patients at the clinics, $\chi^2(6) = 94.6, p < .001$, if those with missing information are included in the analysis, as they are most likely Hispanics. Clinics A and
D patients were predominantly Black/African American whereas Clinic B patients were majority Hispanic.

It is not surprising, given the racial/ethnic differences that the language of the patients also differs significantly by clinic, $\chi^2(4) = 90.18, p < .001$, with English predominating at Clinics A and D and Spanish predominating at Clinic B. There were no significant differences in poverty level distribution by Clinic, $\chi^2(6) = 11.75, p = .068$. All patients seen at these clinics are poor, with the vast majority under 100% of the poverty line.

**PRAPARE Results**

Table 6

*PRAPARE Questions by Facility.*

<table>
<thead>
<tr>
<th></th>
<th>A $(n = 123)$</th>
<th>B $(n = 77)$</th>
<th>Total $(n = 222)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$ (%)</td>
<td>$n$ (%)</td>
<td>$n$ (%)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than HS</td>
<td>26 (21.1)</td>
<td>25 (32.5)</td>
<td>52 (23.4)</td>
</tr>
<tr>
<td>HS or GED</td>
<td>50 (40.7)</td>
<td>14 (18.2)</td>
<td>64 (28.8)</td>
</tr>
<tr>
<td>More than HS degree</td>
<td>40 (32.5)</td>
<td>18 (23.4)</td>
<td>59 (26.6)</td>
</tr>
<tr>
<td>Missing</td>
<td>7 (5.7)</td>
<td>20 (26.0)</td>
<td>47 (21.2)</td>
</tr>
<tr>
<td><strong>Work Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed, seeking work</td>
<td>33 (53.7)</td>
<td>21 (27.3)</td>
<td>89 (40.1)</td>
</tr>
<tr>
<td>Part time or temporary</td>
<td>14 (11.4)</td>
<td>9 (11.7)</td>
<td>23 (10.4)</td>
</tr>
<tr>
<td>Full time</td>
<td>8 (6.5)</td>
<td>15 (19.5)</td>
<td>23 (10.4)</td>
</tr>
<tr>
<td>Unemployed and not seeking work</td>
<td>26 (21.1)</td>
<td>12 (15.6)</td>
<td>38 (17.1)</td>
</tr>
<tr>
<td>Missing</td>
<td>9 (7.3)</td>
<td>20 (26.0)</td>
<td>49 (22.1)</td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not have housing</td>
<td>62 (50.4)</td>
<td>13 (16.9)</td>
<td>78 (35.1)</td>
</tr>
<tr>
<td>Have housing</td>
<td>52 (42.3)</td>
<td>44 (57.1)</td>
<td>96 (43.2)</td>
</tr>
<tr>
<td>Missing</td>
<td>9 (7.3)</td>
<td>20 (26.0)</td>
<td>48 (21.6)</td>
</tr>
<tr>
<td>Worried about losing housing</td>
<td>22 (17.9)</td>
<td>10 (13.0)</td>
<td>33 (14.9)</td>
</tr>
<tr>
<td>Missing</td>
<td>12 (9.8)</td>
<td>23 (29.9)</td>
<td>54 (24.3)</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack, nonmedical appointments</td>
<td>8 (6.5)</td>
<td>4 (5.2)</td>
<td>12 (5.4)</td>
</tr>
<tr>
<td>Lack, medical appointments</td>
<td>34 (27.6)</td>
<td>7 (9.1)</td>
<td>43 (19.4)</td>
</tr>
<tr>
<td>No effect</td>
<td>72 (58.5)</td>
<td>46 (59.7)</td>
<td>118 (53.2)</td>
</tr>
<tr>
<td>Missing</td>
<td>9 (7.3)</td>
<td>20 (26.0)</td>
<td>49 (22.1)</td>
</tr>
</tbody>
</table>
Table 6 Continued

<table>
<thead>
<tr>
<th>In the past year, have you not been able to get the following when you needed them</th>
<th>A $(n = 123)$</th>
<th>B $(n = 77)$</th>
<th>Total $(n = 222)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Clothing</td>
<td>24 (19.5)</td>
<td>8 (10.4)</td>
<td>32 (14.4)</td>
</tr>
<tr>
<td>Food</td>
<td>29 (23.6)</td>
<td>21 (27.3)</td>
<td>50 (22.5)</td>
</tr>
<tr>
<td>Child Care</td>
<td>3 (2.4)</td>
<td>0</td>
<td>3 (1.4)</td>
</tr>
<tr>
<td>Medicines or other health care</td>
<td>24 (19.5)</td>
<td>10 (13.0)</td>
<td>34 (15.3)</td>
</tr>
<tr>
<td>Phone</td>
<td>4 (3.3)</td>
<td>1 (1.3)</td>
<td>5 (2.3)</td>
</tr>
<tr>
<td>Utilities</td>
<td>12 (9.8)</td>
<td>5 (6.5)</td>
<td>17 (7.7)</td>
</tr>
<tr>
<td>No Lacks</td>
<td>56 (45.5)</td>
<td>40 (51.9)</td>
<td>96 (43.2)</td>
</tr>
<tr>
<td>Missing</td>
<td>6 (4.9)</td>
<td>1 (1.3)</td>
<td>29 (13.1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Talk to people you care about</th>
<th>A $(n = 123)$</th>
<th>B $(n = 77)$</th>
<th>Total $(n = 222)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Less than once per week</td>
<td>31 (25.2)</td>
<td>11 (14.3)</td>
<td>43 (19.4)</td>
</tr>
<tr>
<td>1-2 times per week</td>
<td>23 (18.7)</td>
<td>16 (20.8)</td>
<td>39 (17.6)</td>
</tr>
<tr>
<td>3-5 times per week</td>
<td>19 (15.4)</td>
<td>23 (29.9)</td>
<td>42 (18.9)</td>
</tr>
<tr>
<td>More than 5 times per week</td>
<td>40 (32.5)</td>
<td>7 (9.1)</td>
<td>48 (21.6)</td>
</tr>
<tr>
<td>Missing</td>
<td>10 (8.1)</td>
<td>20 (26.0)</td>
<td>50 (22.5)</td>
</tr>
<tr>
<td>Refugee</td>
<td>2 (1.6)</td>
<td>4 (5.2)</td>
<td>6 (2.7)</td>
</tr>
<tr>
<td>Missing</td>
<td>6 (4.9)</td>
<td>18 (23.4)</td>
<td>44 (19.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stressed</th>
<th>A $(n = 123)$</th>
<th>B $(n = 77)$</th>
<th>Total $(n = 222)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Not at all</td>
<td>30 (24.4)</td>
<td>15 (19.5)</td>
<td>46 (20.7)</td>
</tr>
<tr>
<td>A little bit</td>
<td>37 (30.1)</td>
<td>19 (24.7)</td>
<td>56 (25.2)</td>
</tr>
<tr>
<td>Somewhat</td>
<td>15 (12.2)</td>
<td>5 (6.5)</td>
<td>20 (9.0)</td>
</tr>
<tr>
<td>Quite a bit</td>
<td>13 (10.6)</td>
<td>5 (6.5)</td>
<td>18 (8.1)</td>
</tr>
<tr>
<td>Very much</td>
<td>20 (16.3)</td>
<td>14 (18.2)</td>
<td>35 (15.8)</td>
</tr>
</tbody>
</table>

Table 6 displays responses to questions about SDH that are asked about on the PRAPARE tool. Only results for Clinics A and B are provided. Clinic C had only information from 3 patients and Clinic D had missing PRAPARE answers. The total includes patients from all clinics.
Bar Graph Comparing Clinic A and Clinic B PRAPARE responses.

The total PRAPARE score is calculated as a tally score. The overall PRAPARE score did not differ between Clinics A and B, \( t(198) = 1.004, p = .317 \). There are differences, however, in which social determinants of health are lacking as demonstrated in Figure 1. Clinic D did not provide work or education information so the following results compare only Clinics A and B. There were significant differences in educational level between these two clinics, \( \chi^2(2) = 9.61, p = .008 \), with significantly more of Clinic B’s sample having less than a high school education. The samples also differed significantly by work status, \( \chi^2(3) = 14.23, p = .003 \), with a higher percentage of Clinic A’s patients unemployed than Clinic B’s. It should be noted, however, that data on education and work status were missing for over one quarter of Clinic B’s patients. Nevertheless, knowledge of the population served by the clinics suggests these differences in the samples do reflect differences in patients served. A statistically higher percentage of patients at Clinic A (at the homeless shelter) lacked housing than did those at Clinic B, \( \chi^2(1) = 15.39, p < \)
. Of those with responses, 54.4% of Clinic A’s patients lacked housing compared with 
22.8% of patients at Clinic B. Patients at Clinic A were significantly more likely to miss medical 
appointments than patients at Clinic B (29.8% vs. 12.3% of those with responses) due to lack of 
transportation, χ²(2) = 6.57, p = .037. There was a significant difference in how often patients 
interacted with people they cared about, with patients at Clinic A much more likely to say More 
than 5 times per week than patients at Clinic B (35.4% vs. 12.3% of those with responses), 
χ²(3) = 17.82, p < .001.

There were no statistically significant differences between Clinics A and B in the 
percentage of those worried about losing housing, χ²(1) = 0.039, p = .843; the amount of stress 
reported, χ²(4) = 1.82, p = .769; the percentage who spent a night in jail, χ²(1) = 2.55, p = .110; 
percentage who felt unsafe, χ²(2) = 0.72, p = .697; percentage afraid of their partner, χ²(2) = 
0.67, p = .717; or in the percentage of refugees, χ²(1) = 3.06, p = .080. There were also no 
differences in the percentage of patients in Clinics A and B who reported lacking clothing, χ²(1) 
= 3.32, p = .068; food, χ²(1) = 0.19 p = .659; child care, χ²(1) = 2.02, p = .156; medicine or other 
health care, χ²(1) = 1.72, p = .190; phone, χ²(1) = 0.81, p = .369; or utilities, χ²(1) = 0.78, 
p = .378.

**Health Outcomes**

Blood pressures were available for 218 of the patients. Mean systolic blood pressure was 
128.2 (SD = 15.7) and mean diastolic blood pressure was 78.8 (SD = 10.4). Using one-way 
ANOVA to compare mean blood pressure, there were no statistically significant differences in 
systolic BP by Clinic, F(3, 214) = 0.214, p = .427. Diastolic BP did differ significantly by 
Clinic, F(3, 214) = 6.36, p < .001, ranging from 81.2 at Clinic A, 76.7 at Clinic B, 77.0 at Clinic 
C, and 71.7 at Clinic D. Although statistically significant, these means are all within normal
ranges, so not clinically significant. For the 150 patients with Hemoglobin A1c readings, means were 6.46 (SD = 2.44), ranging from 0 to 17.4. There was statistically significant difference in Hemoglobin A1c by Clinic (Clinic C was not included in this analysis because of two few cases with Hemoglobin A1c readings), \( F(2, 146) = 6.99, p = .001 \). Patients at Clinic B had significantly higher Hemoglobin A1c levels (\( M = 7.33, SD = 2.90 \)) than those at Clinic A (\( M = 5.79, SD = 2.06 \)) or Clinic D (\( M = 6.27, SD = 0.94 \)).

**Association between PRAPARE and Physiological Measures**

To examine the relationship between PRAPARE scores and blood pressure and Hemoglobin A1c, Pearson Product Moment Correlations were conducted. There were no significant relationships between PRAPARE scores and any of the physiological measures, as shown in Table 7. In fact, the correlations were very close to zero, indicating no relationship between PRAPARE scores and these physiological measures.

**Table 7**

*Correlations between PRAPARE and Physiological Measures.*

<table>
<thead>
<tr>
<th></th>
<th>Systolic BP</th>
<th>Diastolic BP</th>
<th>Hemoglobin A1c</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r</strong></td>
<td>-.116</td>
<td>-.057</td>
<td>.042</td>
</tr>
<tr>
<td><strong>PRAPARE score</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chapter V
Discussion and Conclusions

Despite mounting interest in SDH, there continues to be a lack of research nationally exploring interventions (both screening and addressing SDH) in clinical settings. Educating clinical staff and integrating a SDH screening tool into primary care provided the opportunity to evaluate the PRAPARE tool, patients’ SDH needs, and clinical staff’s comfort addressing SDH. This chapter will discuss the findings of the study, limitations, implications for practice, and conclusions.

Discussion of Findings

Survey findings. Survey results revealed that the clinical staff rated the training highly, and felt comfortable addressing SDH, but lacked confidence in the ability to integrate the tool into clinical practice. Eighty percent of respondents felt comfortable addressing SDH with their patients, which is the opposite of the national study conducted by RWJF (2011), where 80% of physicians did not feel comfortable addressing SDH. The RWJF survey was a national study evaluating physicians in a variety of settings, thus location of practice may be a contributing factor to comfort levels i.e.: primary care vs. intensive care.

When asked what was the biggest barrier to screening for SDH, the majority of respondents cited time as the major factor. Sixty percent of respondents said they used the PRAPARE tool with 10% or fewer of their patients, despite having 12 weeks during the data collection period. In the clinics in Hope Healthcare, patient visits are 15 minutes in duration and are also frequently overbooked. This time constraint was the single most identified barrier in the open-ended question section of the second survey. This was consistent with the WellRx Pilot
study done integrating SDH in primary care by Page-Reeves et al., (2016). Lack of time likely also contributed to difficulty integrating the tool, especially if a patient was illiterate and required an interpreter to complete the tool.

Lack of time was expected to be a barrier for the project, and participant responses affirmed this challenge. As the healthcare system evolves to outcomes based reimbursement, one consideration for acquiring better patient data is increasing the length of time allotted the provider with each patient seen. The current reimbursement fee-for-service model incentivizes providers seeing high volumes of patients, which has led to shrinking length of primary care visits (Rabin, 2014). Policy change proposals incentivizing health outcomes could help to increase visit times by paying for performance rather than volume, which could in turn provide more time to screen and address social issues.

Over 45 clinical staff received the SDH training, but only 15 completed the surveys. This could be attributed to the fact that participation was voluntary and there was no incentive offered for completing the survey. For future studies, an incentive may help boost participant survey responses. Both surveys were electronic and sent via Survey Monkey. With the education intervention being in person, there likely would have been a higher response rate if the first survey was completed on paper. Lack of time may have also been a factor as the staff are exceptionally busy during the clinic day and the email was sent to their work email address.

When asked to estimate percentage of social needs in the second survey, responses were highly variable compared to what patient’s reported. For example, stress and incarceration rates were overestimated compared to patient data, but the need for housing and social isolation was underestimated. This underscores the importance of adequate time to complete screening on each patient, in order to obtain accurate information and offset individual bias. By incorporating
screening into routine care or checklist, this could ensure that all patients are offered the screening rather than leaving it to individual staff to decide whether or not to broach social needs.

Over 70% of survey respondents indicated that they were more likely to refer patients to social services after utilizing the PRAPARE tool with the patient, which was an unexpected finding in the project. Further evaluation through longitudinal study could be helpful to evaluate if patients followed through and connected with a social worker, because simply referring a patient does not always translate into a connection to that resource (Bodenheimer, 2008). Despite a variety of clinical staff responding, there was no social service staff represented in the surveys. With social service providers being a key element in addressing SDH, it was unfortunate to not have their voice included.

When asked if staff were well informed about resources to address SDH, 40% of survey respondents identified that they either were neutral or disagreed. Of all of the questions in the survey evaluating the experience using PRAPARE, this question received one of the lowest scores. This indicates that additional education in needed to better inform the staff of available organization and community resources. In partnership with the IT and social services department, an order set embedded within the EHR is being developed that will include handouts pertaining to each of the specific social determinants. This will allow staff to immediately print out a resource guide for the patient. This may boost provider confidence and save time during the visit.

**PRAPARE results.** The demographic data including race and poverty levels were consistent with data reported annually through HRSA (2016). Housing data for HRSA reporting is traditionally collected during registration and 10% of Hope Healthcare’s patients in the 2016
report were homeless. PRAPARE data revealed a much higher rate, even when the clinic at the homeless shelter was excluded. The community health center had a low rate of responses to this question on the PRAPARE tool, but of the 13 patients screened 16.9% reported that they did not have housing.

It is unclear where the discrepancy lies, but the directness and further explanation of the question in the PRAPARE tool may reveal higher percentage of respondents experiencing homelessness. The question asks *what is your housing situation today?* Choices include: I have housing or I do not have housing (staying with others, in a shelter, in a hotel, or outside). When patients are being registered they are asked for an address, rather than asking if they have housing, and this difference may be where the discrepancy arises. Having accurate representation of the number of people experiencing homelessness is not only important in connecting them to social services, but also in grant funding as a health care for the homeless organization.

There was a statistically significant difference between each category of education attainment, primary language, and employment status in patients from Clinic A vs. Clinic B. Clinic B had the higher percentage of patients who had less than a high school degree, spoke Spanish as their preferred language, but had a higher rate of full time employment. In DC, the highest unemployment rate in January 2017 was in Ward 8 at 12.9% (Office of Labor Market Research, 2017). This is only a fraction of what was screened using the PRAPARE tool. Both rates of unemployment: Clinic A: 53.7% and Clinic B: 27.3% represent a much higher rate of unemployment compared to the city or national averages even when controlled by education level. In January 2017 unemployment rate for those with less than high school diploma was 7.7%, and high school diploma or GED was 5.3% (Bureau of Labor Statistics, 2017). Nationally in 2016 the unemployment rates for Black or African Americans was 14.1% and more than
double the White populations at 6.5% for those with less than a high school degree. The PRAPARE data revealed that the patients have a disproportionate share of unemployment compared to national averages.

Having this type of clinic level data has the potential to influence allocation of resources within organizations to meet the specific needs identified. When comparing Clinic A and Clinic B, the overall PRAPARE scores had no statistically significant difference, meaning that they both had high levels of SDH barriers to care, but those barriers differed at each site. Clinic A had statistically significant higher rates of homelessness, unemployment, and social isolation, whereas Clinic B had higher rates of low education attainment, non-English speakers, and refugees. This supports tailoring services to each site’s unique needs.

**PRAPARE and physiological measures.** Due to lack of evidence evaluating the direct effect of SDH on health outcomes, physiological measures were included in the study to further evaluate the relationship to blood pressure and diabetes. Between Clinic A and Clinic B there was a statistically significant difference and clinically significant Hemoglobin A1c mean (Clinic A $M = 5.79$ vs Clinic B $M = 7.33$). A Hemoglobin A1c $>6.4$ is indicative of having diabetes, $>7$ reflects uncontrolled diabetes. Despite no correlation between the PRAPARE score and Hemoglobin A1c, it is evident that Clinic B has a higher rate of diabetes. Screening patients for SDH with chronic conditions like diabetes may be helpful in identifying barriers to care like access to healthy foods. It also highlights where allocation of resources should be targeted when there are service limitations.

Walker et al., (2014) did a systematic review evaluating the impact of SDH in people diagnosed with diabetes. They concluded that the relationship of SDH and health outcomes continues to be poorly understood. When correlating both blood pressure and diabetes with the
PRAPARE score there were no statistically significant differences. This may be in part due to evaluating the general population rather than isolating individuals with the diagnosis of hypertension or diabetes. This DNP project included all patients with and without a diagnosis of diabetes. In future investigation, one may consider doing a specific analysis on patients with the diagnosis of diabetes, utilizing Hemoglobin A1c, and evaluating the correlation with each social determinant.

**Limitations**

Initially this project was designed to be implemented across the entire Hope Healthcare organization as part of Medicaid payment reform. With the organization having over 80,000 adult patients, this would have provided a significantly larger sample size. Moreover, being able to compare screening across more clinic sites would have provided more robust analysis. The executive management decided that the PRAPARE tool was overly time intensive to be included in the initial intake required for MyHealthGPS. Support for SDH screening remains, but time constraints in primary care on the executive level and in the day-to-day reality of the clinic continues to be the largest barrier.

One significant limitation was that of the 45 clinical staff that received training, only 15 answered either survey. Specifically, there was no response from the social services staff, and limited support staff represented in the survey. This significantly limited the ability to understand what the staff’s level of comfort is regarding screening/addressing SDH, and the need for future training. Ideally, with increased response rate, there would be more robust evidence to analyze responses across specialties to highlight areas for growth and need for retraining.

With two of the four sites having very low PRAPARE utilization, little meaningful information was gleaned from these sites. Clinic D screened 16 patients for food insecurity for a
particular program but did not respond to the other domains. This site missed the opportunity to screen patients and address various SDH, and limited the use of the information obtained. The reason why Clinic C had an n of 4 was due to the fact that the provider received the training floated there to cover one session and does not routinely work at this site. The screening completed at these sites added to the overall information obtained via the PRAPARE tool, but more completed tools and an increased number of patients would have led to a more robust analysis and comparison across all four sites.

Having the PRAPARE tool available in only English and Spanish was a limitation. Ideally it would have been available in Amharic as well, which is the third most common language at Hope Healthcare. This may have allowed for wider participation across ethnic groups, or potentially more patients could have been screened.

The survey design did not lend itself to pre and post analysis. It may have revealed more information to assess knowledge prior to the education intervention and after PRAPARE implementation. There was no validated assessment tool, thus the results were not generalizable. It would have been ideal to compare the responses to clinical staff across various types of clinical practice or across different parts of the country.

**Implication for Future Practice, Education, and Policy Dissemination**

The staff at this FQHC reported and demonstrated knowledge, comfort, and the clinical importance of SDH. Screening and addressing SDH aligns with the values of community health centers. Over the past two years NACHC has disseminated PRAPARE tool kits and webinars with the aim of implementing the PRAPARE tool across the country. When the PRAPARE tool is implemented nationally, this could help build evidence for risk assessments and risk
stratification. This type of assessment could be a driver for payment reform by demonstrating the disproportionate need of the patients who receive care in community health centers.

Implementing the PRAPARE tool into practice has become streamlined with the toolkit developed by NACHC. Their timeframe indicates that from design to implementation takes about four months of planning with a multidisciplinary team. With growing interest in supporting research about SDH, NACHC, University at San Francisco’s Social Interventions Research & Evaluation Network (SIREN) initiative, and CMS have a variety of funding sources to support these efforts (CMS.gov, 2017; NACHC, 2017; SIREN, 2017).

Staff working at a FQHC presumably have self-selected to work with underserved populations, which may be one contributing factor to the identification of comfort with SDH. This comfort is not generalizable to all clinicians, yet SDH impacts patients across the acuity spectrum. SDH and health equity training could be incorporated within both nursing and medical education through both didactic and service learning opportunities. This would require further investigation about the impact of the various types of learning on provider behavior and comfort discussing SDH with their patients.

Screening for SDH is a starting point and not a destination. Obtaining SDH information can provide useful information for clinicians and organizations, but ultimately the hope is that the patients are being connected to resources to address the identified need. When implementing a SDH screening tool, it is important to also consider creating a referral structure in which resources have been identified to correlate with each SDH identified. Also, allowing the patient to have adequate time to respond to each question is essential to ensure that answers are accurately reflecting the patient’s reality.
Support staff required a great deal of encouragement and support over the twelve weeks. They would forget to use the screen, as it was not a part of their mandatory checklist for each patient. This may signify a need for follow-up training rather than a one-time education intervention. The medical assistants were the main driver of the screening as it was done during the intake process, thus when not implemented before a visit, it was rarely completed during or after. This suggests that having buy-in from nursing leadership with implementation into routine workflow would be essential for full integration into clinic practice. A possible adjunctive solution to the medical assistant being under significant time pressure could be to utilize volunteers who have had SDH patient privacy training. College students or local senior citizens could be utilized to help the patient complete the screening and help connect the patient to social services. This may decrease the workload of the medical assistant staff and increase the number of patients screened.

The WHO Framework for Tackling SDH Inequities includes four levels of impact: micro, mesa, macro, and globalization. Screening for SDH occurs on the micro level, and subsequently this information can be aggregated to provide mesa level information, which can be utilized to advocate for policy change on the macro level. Hope Healthcare provides healthcare to one-sixth of DC’s population. By demonstrating specific areas of need by the ward level, this could help advocate for policies that could positively impact the community.

**Recommendations for Further Study**

The recommendations for further study in this emerging area are innumerable. Further study is needed in areas of education about health equity/SDH, SDH screening tools, impact of SDH on health outcomes, impact of addressing SDH on health outcomes over time, risk stratification using SDH, and cost benefit analysis addressing SDH. Current evidence reveals
only a casual relationship between SDH and health outcomes, thus studies evaluating one determinant to one clinical outcome are needed to further explain the phenomenon. Specifically, assessing people who have been diagnosed with diabetes or hypertension and screening this subset of patients using the PRAPARE score to evaluate the correlation between the uncontrolled diabetes and uncontrolled hypertension.

Obtaining SDH information on the individual level provides information with which providers can tailor treatment plans. It remains unclear if screening and addressing SDH improves health outcomes. In order to track addressing SDH and outcomes, longitudinal studies tracking the connection to social services, change of the PRAPARE score overtime, and clinical outcomes are needed. Additionally, assessing efficacy of increasing length of visits to identify what is most conducive to screening for SDH vs. hiring additional staff to complete the screening.

The staff had positive reactions to the use of the PRAPARE tool, but the tool was underutilized and patients were screened infrequently, seemingly due to time constraints. Future researchers may consider doing a qualitative study design doing group interviews to assess the attitudes, feelings, and barriers to screening patients for SDH. Ideally, performing a randomized controlled trial employing different models of when to screen the patient, using various staff, will also be helpful in identifying what it the most time effective and yields more completed screenings.

**Conclusion**

Despite the knowledge that 90% of a person’s health status is shaped by SDH, the relationship between SDH and health outcomes is poorly understood. By educating clinical staff and implementing the SDH screening tool PRAPARE, 222 patients were screened and a
significant amount of information was learned about our staff and patients. This information led to better awareness of the patients’ barriers to care and also increased referrals to social services. There was no correlation between the PRAPARE score and blood pressure or Hemoglobin A1. Further longitudinal research is needed to explore this relationship with specific determinants. Health inequities continue to be bleak in the US and with a dearth of research in the area of SDH, there is still a great deal of work to be done.
Appendix A

Whitehead and Dahlgren Main Determinants of Health Model

Used with permission (Appendix L).


Appendix B

A Conceptual Framework for Action on the Social Determinants of Health (SDH)

Used with permission (Appendix M).
Appendix C

Conceptual Framework for Tackling SDH Inequities

Figure B. Framework for tackling SDH inequities

Used with permission (Appendix M).
Appendix D

PRAPARE Screening Tool: Spanish Version

PRAPARE: Protocolo para responder y evaluar los activos riesgos y experiencias de los pacientes. Unity Healthcare Inc. se preocupa por usted como una persona integral. Su salud es solo una parte de quién es usted y de sus otras características, incluidos los determinantes sociales de la salud, tales como dónde trabaja, juega y crece. Para satisfacer mejor sus necesidades, estamos realizando una serie de preguntas para evaluar sus determinantes sociales de la salud.

1. ¿Cuál es su situación de vivienda en la actualidad?
   ____ Tengo vivienda
   ____ No tengo vivienda (estoy alojado/a con otras personas, en un hotel, en un refugio, viviendo afuera, en la calle, en un banco, en un automóvil o en un parque)
   ____ Prefiero no responder esta pregunta

2. ¿Está preocupado(a) por perder su vivienda?
   ____ Sí
   ____ No
   ____ Prefiero no responder esta pregunta

3. ¿Cuál es el nivel más alto de educación que ha completado?
   ____ Menos de la escuela secundaria
   ____ Diploma de escuela secundaria o GED
   ____ Más que la escuela secundaria
   ____ Prefiero no responder esta pregunta

4. ¿Cuál es su situación laboral actual?
   ____ Desempleado(a)
   ____ Trabajo temporal o a tiempo parcial
   ____ Trabajo a tiempo completo
   ____ Desempleado(a), pero no busca trabajo (ejemplo: estudiante, jubilado, discapacitado, proveedor primario de cuidados sin remuneración)
   ____ Prefiero no responder esta pregunta

5. El año pasado, ¿usted o algún miembro de su familia que vive con usted no han podido obtener algunos de los siguientes cuando eran realmente necesarios? Marque todos los que apliquen.

   Si   No
   --- Alimentos
   --- Servicios públicos
   --- Ropa
   --- Cuidado de niños
   --- Teléfono
   --- Medicina o cualquier tipo de atención médica (médicos, atención odontológica, de salud mental, visión)
   --- Otro (indique):

6. ¿La falta de transporte le ha impedido asistir a las citas médicas, reuniones, trabajo o de conseguir las cosas necesarias para su vida diaria? Marque todos los que apliquen.

   Si, me ha impedido asistir a las citas médicas u obtener mis medicamentos
   Si, me ha impedido asistir a las reuniones no médicas, citas, trabajo, u obtener las cosas que necesito
   No
   Prefiero no responder
7. ¿Con qué frecuencia visita o habla con las personas por quienes se preocupa y de las cuales se siente cercano? (Por ejemplo: habla con amigos por teléfono, visita a amigos o familiares, va a la iglesia o asiste a reuniones de clubes)
   ___ Menos de una vez a la semana
   ___ 1 a 2 veces a la semana
   ___ 3 a 5 veces a la semana
   ___ 5 a más veces a la semana
   ___ Prefiero no responder esta pregunta

8. ¿Qué tan estresado(a) está? El estrés es cuando alguien se siente tenso, nervioso, ansioso o no puede dormir por la noche porque su mente está perturbada.
   ___ Para nada
   ___ Un poco
   ___ En alguna manera
   ___ Bastante
   ___ Mucho
   ___ Prefiero no responder esta pregunta

9. El año pasado, ¿pasó más de 2 noches seguidas en una cárcel, prisión, centro de detención, o correccional de menores?
   ___ Sí
   ___ No
   ___ Prefiero no responder esta pregunta

10. En cualquier momento en los últimos 2 años, ¿el trabajo agrícola de temporada o para emigrantes ha sido la fuente principal de ingresos de usted o de su familia?
    ___ Sí
    ___ No
    ___ Prefiero no responder esta pregunta

11. ¿Usted es un refugiado(a)?
    ___ Sí
    ___ No
    ___ Prefiero no responder esta pregunta

12. ¿Cuál es su país de origen?
    ___ Estados Unidos
    ___ País distinto a los Estados Unidos (escriba el país de origen en la historia social)
    ___ Prefiero no responder

13. ¿Se siente emocional y físicamente seguro(a) en el lugar donde vive actualmente?
    ___ Sí
    ___ No
    ___ No está seguro

14. En el año pasado, ¿ha tenido miedo de su pareja o ex pareja?
    ___ Sí
    ___ No
    ___ No está seguro
    ___ No he tenido pareja en el año pasado
    ___ Prefiero no responder

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Used with permission (Appendix N).
Appendix E

PRAPARE Tool: English Version

1. What is your housing situation today?
   - I have housing
   - I do not have housing (staying with other, in a hotel, in a shelter, or living outside)
   - I choose not to answer this question

2. Are you worried about losing housing?
   - Yes
   - No
   - I choose not to answer this question

3. What is the highest level of school that you’ve finished?
   - Less than high school degree
   - High school diploma or GED
   - More than high school
   - I choose not to answer this question

4. What is your current work situation?
   - Unemployed
   - Part-time or temporary work
   - Full-time work
   - Otherwise unemployed but not seeking work (ex: student retired, disabled, unpaid primary care giver) Please write:____________
   - I choose not to answer this question

5. In the past year, have you or any family members you live with been unable to get any of the following when it was really needed? Check all that apply.
   - Yes
   - No
   - Food
   - Utilities
   - Clothing
   - Child care
   - Phone
   - Medicine or any health care (medical, dental, mental health, vision)

   - Other (please write):

6. Has lack of transportation kept you from medical appointments, meetings, work, or from getting things needed for daily living? Check all that apply
   - Yes, it has kept me from medical appointments or from getting my medication
   - Yes, it has kept me from non-medical meetings, appointments, work, or from getting things that I need
   - No
   - I choose not to answer
7. How often do you see or talk to people that you care about and feel close to? (For example: talking to friends on the phone, visiting friends or family, going to church or club meetings)
- Less than once a week
- 1 to 2 times a week
- 3 to 5 times a week
- 5 or more times a week
- I choose not to answer

8. How stressed are you? Stress is when someone feels tense, nervous, anxious, or can’t sleep at night because their mind is troubled.
- Not at all
- A little bit
- Somewhat
- Quite a bit
- Very much
- I choose not to answer this question

9. In the past year have you spent more than 2 nights in a row; in a jail, prison, detention center, or juvenile correctional facility?
- Yes
- No
- I choose not to answer this question

10. At any point in the past 2 years, has seasonal or migrant farm work been your or your family’s main source of income?
- Yes
- No
- I choose not to answer this question

11. Are you a refugee? (Were you forced to leave your country due to persecution from war or violence?)
- Yes
- No
- I choose not to answer this question

12. What country are you from?
- United States
- Country other than the United States (please write in the social history the country of origin)
- I choose not to answer

13. Do you feel physically and emotionally safe where you currently live?
- Yes
- No
- Unsure

14. In the past year, have you been afraid of your partner or ex-partner?
- Yes
- No
- Unsure
- I have not had a partner is the last year
- I choose not to answer
Appendix F
Framework for Educating Health Professionals to Address Social Determinants of Health

Used with permission (Appendix O).
Appendix G

Iowa Evidence Based Practice Model

Problem Focused Triggers
1. Risk Management Data
2. Process Improvement Data
3. Internal/External Benchmarking Data
4. Financial Data
5. Identification of Clinical Problem

Knowledge Focused Triggers
1. New Research or Other Literature
2. National Agencies or Organizational Standards & Guidelines
3. Philosophies of Care
4. Questions from Institutional Standards Committee

Consider Other Triggers

Is the Topic a Priority for the Organization?

Yes
Form a Team

Assemble Relevant Research & Related Literature

Critique & Synthesize Research for Use in Practice

Yes
Is There a Sufficient Research Base?

No
Conduct Research

Pilot the Change in Practice
1. Select Outcomes to be Achieved
2. Collect Baseline Data
3. Design Evidence-Based Practice (EBP) Guidelines
4. Implement EBP on Pilot Units
5. Evaluate Process & Outcomes
6. Modify the Practice Guideline

Base Practice on Other Types of Evidence:
1. Case Reports
2. Expert Opinion
3. Scientific Principles
4. Theory

Continue to Evaluate Quality of Care and New Knowledge

Yes
Institute the Change in Practice

Is Change Appropriate for Adoption in Practice?

No
Disseminate Results

Monitor and Anticipate Structure, Practice, and Outcome Data
- Environment
- Staff
- Cost
- Patient and Family

Reference

DO NOT REPRODUCE WITHOUT PERMISSION

Requests to
Department of Nursing
The University of Iowa Hospitals and Clinics
Iowa City, IA 52242-1000

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Appendix H

Education Plan

**Research Question:** What are the effects of an education intervention on implementing a social determinants of health screening tool in primary care?

**Education goals:**
- Expand understanding of how social determinants of health affect health outcomes
- Increase knowledge about the social determinants of health PRAPARE screening tool
- Explain new work flow to incorporate PRAPARE tool into clinical practice
- Familiarize staff with Unity and community resources to address social determinants of health
- Increase participant comfort in screening for social determinants of health
- Increase participant comfort when addressing social determinants of health

**Teaching Theory**
- Utilize Adult Learning theory and principles including Malcolm Knowles, informal adult education, self-direction and andragogy
  - Self-directing. Teacher encourages and nurtures this movement
  - Teaching methods include discussion, problem-solving etc→ the learning will be interactive, allowing participants to provide examples of SDH, and provide ideas of workflow development
  - Immediately applicable to clinical practice→ after the webinar the staff can integrate the screening tool into practice the next day
  - Learning experiences should be based around experiences→ have the learners work through case studies
- An in person presentation with team based learning. This will allow current PCMH teams to train together.

**Post-webinar surveys**
- The first survey will evaluate the effectiveness of the education
- The second survey will evaluate utilization of the screening tool, comfort levels addressing SDH, and explores barriers to screening and addressing SDH
Appendix I

Survey #1 Social Determinants of Health Education Evaluation

**Education goals:**
1. Expand participant understanding of how social determinants of health affect health outcomes
2. Increase participant knowledge about the social determinants of health screening tool PRAPARE
3. Explain new work flow to incorporate PRAPARE tool into clinical practice
4. Familiarize staff with Unity and community resources to address social determinants of health
5. Increase participant comfort in screening for social determinants of health
6. Increase participant comfort when addressing social determinants of health

**Evaluation:**

Please circle the number that most closely represents your view on each of the following.

1. How well did the training meet the education goals above?
   
   Poor | 1 | 2 | 3 | 4 | Excellent | 5

2. How would you rate the quality of the presenter?
   
   Poor | 1 | 2 | 3 | 4 | Excellent | 5

3. How would you rate the usefulness of the written handouts/materials?
   
   Poor | 1 | 2 | 3 | 4 | Excellent | 5

4. What is the practical value of the subject matter to you?
   
   Poor | 1 | 2 | 3 | 4 | Excellent | 5

5. How well did the webinar explain the PRAPARE tool?
   
   Poor | 1 | 2 | 3 | 4 | Excellent | 5

6. How comfortable do you feel integrating the PRAPARE screening tool into clinical practice?
   
   Poor | 1 | 2 | 3 | 4 | Excellent | 5
Learner Objectives:
At the end of this training, the attendee will be able to:

- Identify social determinants of health that affect individuals receiving care at Unity Healthcare
- Discuss the case study and how social determinants of health impacts a person’s health status
- Demonstrate an ability to apply the PRAPARE tool to the case study

7. How would your rate your understating about social determinants of health?

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<tr>
<th>Poor</th>
<th>Excellent</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

8. How would you rate your understanding of how social determinants of health impacts health status?

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<thead>
<tr>
<th>Poor</th>
<th>Excellent</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
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<tr>
<td>3</td>
<td>4</td>
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<tr>
<td>5</td>
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</table>

9. How would your rate your comfort level utilizing the PRAPARE tool?

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<tr>
<th>Poor</th>
<th>Excellent</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
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<td>3</td>
<td>4</td>
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<tr>
<td>5</td>
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</table>

10. What did you like most about the training?

______________________________________________________________________________

11. What did you like least about the training?

______________________________________________________________________________

12. Do you have specific suggestions as to how this training might be improved?

______________________________________________________________________________
Appendix J

Survey #2 Post PRAPARE Implementation

1. What is your role at Unity Healthcare? Please choose one
   - Case manager
   - RN/LPN
   - Medical Assistant
   - Nurse Practitioner
   - Physician
   - Physician Assistant
   - Other (please specify)

2. What is your age?
   - 18 to 24
   - 25 to 34
   - 35 to 44
   - 45 to 54
   - 55 to 64
   - 65 to 74
   - 75 or older

3. Did you participate in Unity's webinar training about Screening for Social Determinants of Health?
   - Yes
   - No

4. Which of the following best represents the percentage of your adult patients you are screening for SDH using the PRAPARE tool?
   - 0%
   - 10%
   - 25%
   - 50%
   - 75%
   - 90%
   - 100%
5. How strongly do you agree or disagree with each of the following statements?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The PRAPARE tool Smart Form is easy to use</td>
<td></td>
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<tr>
<td>The work flow for the PAPARE tool is clearly defined</td>
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<tr>
<td>The PRAPARE tool helps me to better assess SDH</td>
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<tr>
<td>I am more likely to refer a patient to social services after using the PRAPARE tool</td>
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<tr>
<td>I am well informed about resources available to address my patients' unmet social needs.</td>
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<tr>
<td>Addressing patients' social needs is as important as addressing their medical conditions.</td>
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<tr>
<td>I feel comfortable talking with my patients about addressing social determinants of health</td>
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<tr>
<td>Patients frequently express health concerns caused by unmet social needs that are beyond my control</td>
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<tr>
<td>I understand how social determinants of health impact a person's health</td>
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</tbody>
</table>
6. Estimate what percentage of your patients have experienced the following social determinants of health. Check the most appropriate box

<table>
<thead>
<tr>
<th>Social Determinant</th>
<th>0-20%</th>
<th>21-40%</th>
<th>41-60%</th>
<th>61-80%</th>
<th>81-100%</th>
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</thead>
<tbody>
<tr>
<td>Lack of housing/inadequate housing</td>
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<td>Lack of education (less than high school degree)</td>
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<td>Lack of employment/Under employment</td>
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<td>Lack of financial resources for food, utilities, clothing, childcare, phone, etc.</td>
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<tr>
<td>Lack of transportation</td>
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<tr>
<td>Social isolation</td>
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<tr>
<td>High stress levels</td>
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<td>History of Incarceration</td>
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<td>Refugee/immigration status</td>
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<tr>
<td>Domestic violence</td>
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</tbody>
</table>
7. Please identify the most significant barrier that you have to **addressing** social determinants of health with your patients?

- [ ] Lack of time
- [ ] Inadequate training
- [ ] Discomfort talking with patients about social determinants of health
- [ ] Lack of awareness of community resources to address social determinants of health
- [ ] Lack of support staff ie: social services, mental health, nursing etc.
- [ ] Other (please specify)

8. What are some ways that Unity could better address social determinants of health? (choose all that apply)

- [ ] Increase length of patient visits
- [ ] Hire additional support staff ie: case managers, mental health, nursing etc.
- [ ] Improve partnerships with community organizations addressing social determinants of health
- [ ] Provide additional education/training
- [ ] Other (please specify)

9. Please share any thoughts you have about the PRAPARE tool including but not limited to: content, ease of smart form, length of time needed to complete, barriers to use etc.

____________________________________________________________________________________________

____________________________________________________________________________________________
## Appendix K

### Gantt Project Timeline

<table>
<thead>
<tr>
<th>Objective</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
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<tbody>
<tr>
<td>Design &amp; Build</td>
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<td><em>AM1: Obtain project approval</em></td>
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<td><em>Organize SDH steering group and meet monthly</em></td>
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<td><em>Meet with executive management team for formal approval</em></td>
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<td><em>AM2: Participate in SDH Training</em></td>
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<td><em>NOC/HC-PHANARE training</em></td>
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<td><em>NOC/HC SDH Configuration training</em></td>
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<td><em>SDH Academy training</em></td>
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<td><em>AM3: Adopt PHANARE tool for Unity</em></td>
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<td><em>Eliminate redundant questions</em></td>
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<td><em>Develop format for the questionnaires</em></td>
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<td><em>Complete and hand over to Payback</em></td>
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<td><em>Goal 1: Configure PHANARE tool into SDW</em></td>
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<td><em>Goal 2: Modify existing tool in SDW 10 nodes</em></td>
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<td><em>Goal 3: Test tool structure data for entire</em></td>
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<td><em>Goal 4: Design and standard operating procedure for entire text</em></td>
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<td><em>Goal 5: Design resource sheet to address SDH</em></td>
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<td><em>Goal 6: Design webinar training for all clinical staff</em></td>
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<td><em>Goal 7: Meet with medical doctors to outline project</em></td>
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<td><em>Goal 8: Provide each clinical staff member to outline project</em></td>
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<td>Administration</td>
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<td><em>Goal 1: Present SDH webinar to everyone</em></td>
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<td><em>Goal 2: Administer survey to all education survey</em></td>
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<td><em>Goal 3: Circulate the tool and input into SDW</em></td>
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<td><em>Goal 4: Administer survey with 90% response and follow-up (Mar 2023)</em></td>
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<td>Management &amp; Control</td>
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<td><em>Review and evaluate</em></td>
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<td><em>Monitor progress to see how many are being done</em></td>
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<td><em>Provide timely feedback to feedback team</em></td>
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<td><em>Administer project</em></td>
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<td><em>Assign tasks to SPC group</em></td>
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<td><em>Present results at the office</em></td>
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<td><em>Present results at conferences</em></td>
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</table>
Appendix L

Permission for Use of Whitehead and Dahlgren’s Main Determinants of Health Model

Karita Siren <karita.siren@iffs.se>
To: "cmp66@georgetown.edu" <cmp66@georgetown.edu>

Dear Courtney,

Institute for future studies grants you hereby permission to reprint the figure "The Main Determinants of Health" by Dahlgren G. Whitehead M. 1991. Originally appeared in the publication Policies and Strategies to Promote Social Equity in Health. The permission allows you to reprint the figure in the textbook. The permission also allows you to reproduce this material in online and electronic versions.

The permission is granted providing that the reference to the original work from which the figure is taken is stated correctly in the following way:


http://www.ifss.se/media/1326/20080106110739fim23UVQzvQFShiMRIF8ruT.pdf

All the best

Karita Siren

Receptionväxel
Institutet för Framtidstudier
Box 591
101 21 STOCKHOLM
Tel. 08-402 12 00
Fax 08-24 55 14
Bookadresse: Kornbergatan 13, 4 tr
www.framtidstudier.se
karita.siren@iffs.se
Appendix M


permissions@who.int <permissions@who.int>  Tue, Oct 3, 2017 at 6:54 PM
To: cmp99@georgetown.edu
Cc: permissions@who.int

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We thank you for your interest in WHO published materials.

Kind regards,
WHO Permissions team
Appendix N

Permission for Use of the PRAPARE tool

RE: Requesting permission

Michelle Proser <mproser@nachc.org>
To: Courtney Pladsen <cmg8@georgetown.edu>
Cc: Michelle Jasler <mj Jasler@nachc.org>

Thu, Oct 13, 2016 at 11:51 AM

Of course! So happy to hear of your interest and plans. We just ask that you share your findings. Also, as we are circulating tested resources to help health centers implement PRAPARE and use the data, we always welcome and appreciate additional tested resources that could be shared with others.

Thank you for your interest! Please keep us posted on your progress.

Michelle Proser
NACHC
202.296.1960
Appendix O

Permission for Use of Framework For Educating Health Professionals To Address Social Determinants of Health

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