

ENHANCING COLON CANCER SCREENING IN HOMELESS POPULATIONS:
EDUCATING PROVIDERS ON PATIENT BARRIERS

by

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LAND ACKNOWLEDGEMENT

We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service.

DEDICATION

I want to honor and dedicate this project to individuals currently facing homelessness and the dedicated healthcare professionals who work tirelessly to support and advocate for them. It is my hope that through compassionate care and support, we can reduce the disparities that this vulnerable population experiences.

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ABSTRACT

Purpose: This quality improvement project aimed to increase provider knowledge of the barriers and challenges homeless individuals face in accessing colorectal cancer (CRC) screening and determine if primary care providers' understanding of this issue would influence their willingness to conduct CRC screening with this population.

Background: In the United States (US), CRC is the third most common and the second most fatal cancer in men and women. CRC screening reduces morbidity and mortality by 60%. However, the national CRC screening ranges from 9.5% to 18.8% of the homeless population. To improve this disparity, continuing education of providers on the barriers and challenges homeless individuals face in accessing CRC screening is necessary.

Methods: Guided by the Model for Improvement, participants completed online education that included a pretest, an educational video, and a posttest. The pretest was administered to assess the providers' knowledge of homeless patients' unique challenges. It included questions about providers' attitudes toward performing CRC screenings for homeless patients. The educational video delivered targeted education to healthcare providers, emphasizing the barriers to CRC screening this patient population faces. The posttest assessed the providers' understanding of this issue and willingness to provide CRC screening.

Results: Two primary care providers from different locations at a community health center completed the educational video and the retrospective pretest and posttest. Following the education, all providers expressed a greater willingness to perform CRC screening for individuals experiencing homelessness. However, only 50% of the providers successfully completed all components of the educational intervention. While the providers' responses to

other outcome measures were favorable, the median changes in the Likert scale scores were modest.

Conclusions: The online education provided increased primary care providers' willingness to conduct CRC screening for homeless patients. The providers reported an increased understanding of the barriers to CRC screening faced by homeless patients and felt better equipped to address these barriers. However, the changes in median scores for all outcomes were modest, the sample size was small, and 50% of providers did not complete all aspects of the educational intervention, raising questions about the effectiveness of the education and underscoring the need for additional educational efforts.

INTRODUCTION

Homelessness is a universal issue that affects the United States (US) as well as hundreds of nations worldwide. The US Department of Housing and Urban Development (HUD) defines four categories of homelessness: “literally homeless,” “imminent risk of homelessness,” “homeless under other federal statutes,” and “fleeing or attempting to flee domestic violence” (Asgary, 2018, p. e344). Based on these categories, three and a half million people experience homelessness in the US each year (Asgary, 2018). The most at-risk population for becoming homeless in the US is men aged 45-54; in addition, most homeless individuals were born between the early 1940s and the mid-1960s, and 20% are older than 50 years, an age at which most adults of average risk would need appropriate colorectal cancer (CRC) screening (Asgary, 2018). In the US, CRC is the third most common and the second most fatal cancer in men and women (Dlugasch & Story, 2021, p. 444). Homeless populations often have chronic illnesses, high rates of untreated mental illness, substance abuse, and lack of access to primary care, increasing their risk for CRC even further (Asgary, 2018). CRC is a highly prevalent cause of death despite being preventable by appropriate screening measures. However, information regarding these measures in the homeless population is scarce. The following quality improvement (QI) project is designed to address inadequate CRC screening levels among people experiencing homelessness by implementing CRC screening precautions at a rural outpatient clinic located in the city of South Tucson, Arizona.

Background Knowledge and Significance

The American Cancer Society (ACS) (American Cancer Society [ACS], 2024) estimates that about 106,590 new cases of colon cancer and 46,220 new cases of rectal cancer will occur in

2024. The annual rate of CRC diagnosis has dropped since the mid-1980s due to more people getting screened and changing lifestyle-related factors. From 2011 to 2019, the incidence rate dropped by 1% yearly (ACS, 2024). This downward trend has been primarily in older adults; however, in people younger than 55, rates have increased by 1% to 2% yearly since the mid-1990s (ACS, 2024). Contributing factors to CRC include chronic inflammatory diseases, high-fat, low-fiber diets, alcoholism, smoking, advanced age, obesity, and type 2 diabetes, among others (ACS, 2023). While African Americans, Native Americans, Alaska Natives, and Hispanics have high rates of new cases and deaths from CRC, the death rates in the homeless population are twice as high as the average in the adult population due to CRC diagnosis at later stages (Asgary, 2018). CRC screening reduces morbidity and mortality by 60% and is considered the standard of care (ACS, 2024). The US Preventive Services Task Force (USPSTF) recommends screening for CRC in all adults of average risk aged 45 to 75 (USPSTF, 2021). This recommendation includes an immunochemical fecal occult blood test (FIT) or a fecal occult blood test (FOBT) once yearly, a flexible sigmoidoscopy every five years, or a colonoscopy every 10 years, depending on the test results (USPSTF, 2021). Despite these recommendations, CRC screening rates are low. This is especially true in the homeless population.

Barriers to CRC Screening in the Homeless Population

Limited Access to Healthcare

The national CRC screening ranges from 9.5% to 18.8% of the homeless population (Ioannou et al., 2021). This is 71.8% lower than the national average for adults aged 50 to 75 (Ioannou et al., 2021). Contributing factors include limited access to and utilization of health care due to socioeconomic circumstances (Schwartz et al., 2022). This is aggravated by a high

rate of uninsured or underinsured individuals, resulting in low utilization of preventive and screening services and high rates of CRC diagnoses (Schwartz et al., 2022). According to Schwartz et al. (2022), patient non-adherence, providers not recommending screening, and colonoscopy being nearly impossible to obtain are critical barriers to the optimal use of FIT or FOBT, which is considered for first-line screening. Additionally, the lack of resources, such as a private space to complete bowel preparation, transportation, and proximity to healthcare services, causes delays in receiving care (Schwartz et al., 2022). Consequently, this population faces a high burden of chronic disease and structural barriers that contribute to poor adherence to screening, treatment, and follow-up.

Lack of Trust

Meeting the healthcare needs of homeless individuals is a significant challenge in the US. This challenge is aggravated by a lack of trust in healthcare providers, which is a factor that deters this population from seeking or receiving recommended CRC screening. Their perceptions and attitudes towards healthcare guided by limited health literacy affect their propensity to utilize services and adhere to treatments and follow-up (Thorndike, 2022). Many of these individuals have had negative healthcare experiences due to perceived stigma, discrimination, or poor treatment from providers (Koehler, 2021). According to a study, these negative experiences could adversely influence FIT or FOBT screening, a simple and noninvasive option for CRC screening (Thorndike, 2022). Mental health or substance abuse disorders are prevalent in many homeless individuals affecting their judgment or ability to follow through with care (Thorndike, 2022). This and provider turnover make it difficult to foster and establish a trusting relationship with the healthcare team. Therefore, addressing these issues and increasing trust and

communication between healthcare providers and homeless patients is essential to improve CRC screening and prevention among this vulnerable group.

The literature demonstrates interventions aimed at increasing adherence to screening rates. In a study by Hardin et al. (2020), a three-pronged intervention that included small financial incentives, patient navigators, and patient reminders at a Federally Qualified Health Center (FQHC) increased FIT return from 22% to 49%. While Medicare covers yearly FIT and FOBT tests starting at age 45, the Medicaid expansion program indicates an improvement in coverage, access to care, and economic measures that specifically impact people experiencing homelessness (Lanese et al., 2021). Healthcare entities like FQHCs, whose priority is in medically underserved and low-income communities, are particularly impacted by Medicaid expansion. FQHCs are nonprofit and tax-exempt community-based healthcare providers who receive funding from the Health Resources and Service Administration (HRSA) Health Center Program to provide care services in underserved areas (Lanese et al., 2021). Other interventions used to increase screening often involve mailing reminders and testing kits to patients' homes, reminder phone calls, pamphlets, patient education, and patient navigators (Schwartz et al., 2022). However, these interventions are not feasible for this population due to the nature of homelessness.

Significance to Healthcare

Huang et al. (2017) point out that primary care providers (PCPs) are essential in CRC screening programs, and success depends on their endorsement and recommendation. An electronic health record (EHR) that provides prompts for CRC screening can be implemented to facilitate this. An EHR is a digital version of the patient's chart that includes information such as

medical history, medications, allergies, and test results that can be shared across different healthcare settings. EHRs can help improve the quality and efficiency of healthcare by making information available instantly and securely to authorized users (HealthIT.gov, 2022). Having a patient navigator to manage cancer screening is another intervention at the provider level that increases CRC screening (Huang et al., 2017). A patient navigator is a trained person who helps patients overcome barriers to accessing healthcare services and provides education, support, guidance, and referrals (Centers for Disease Control and Prevention [CDC], 2022). They can also coordinate patient care with different providers. With the use of interventions such as these, healthcare providers can increase the access and uptake of CRC screening in people experiencing homelessness. By addressing barriers and offering convenient and non-invasive screening options, such as the FIT or FBOT testing, healthcare providers can reach more homeless individuals and potentially improve outcomes, reduce health disparities, and save lives in this vulnerable group.

Local Problem

According to the 2023 Point in Time Homeless Count Results conducted in Pima County, Arizona 2,209 people in 1,666 households in Pima County experience homelessness on an average night (City of Tucson, 2023). To combat this problem, the Tucson Pima Collaboration to End Homelessness (TPCH) provides a Coordinated Entry System to assist people at imminent risk of homelessness or experiencing homelessness by providing an assessment for homeless prevention (TPCH, n.d.). Additionally, ColonoscopyAssist is a social program that promotes CRC screening by offering the procedures at affordable rates and providing additional financial assistance as needed (ColonoscopyAssist, n.d.). Despite these programs, homeless populations in

Pima County are significantly less likely to access preventive cancer screening. However, CRC is a significant cause of morbidity and mortality in this population (Arizona Department of Health Services [AZDHS], 2014).

CRC screening is a widespread issue for the community members of Pima County, and the clinic where this intervention will be conducted is no exception. Overseeing the care of 107,000 patients, El Rio Health Center provides primary health care services for pediatric and adult populations, mental health and substance abuse treatment, clinical case management, and assistance with housing services (Solaris Community Capital, n.d.). Additionally, it provides special programs to engage and treat a large homeless population. However, barriers to screening for CRC exist at the system, provider, and individual levels. Asgary (2018) in their systematic review, reported barriers at the system level to include suboptimal counseling by providers, resulting in misconceptions regarding screening among homeless people. The Chief Quality Officer at El Rio Health Center reports CRC screening in the homeless population rate is 16.6% on average, significantly below the state and national levels (M. Jansky, personal communication, February 21, 2024). A poll of the providers at this location who work with this population indicates that they do not routinely recommend screening (M. Jansky, personal communication, February 21, 2024). Nationwide this population has little or no access to primary care providers, insufficient medical health insurance, and inadequate access to healthcare in general (Asgary, 2018). Individual-level factors include a low education level, low socioeconomic status, little knowledge about CRC screening, fear or embarrassment around the screening, and a lack of trust in providers (Asgary, 2018). The barriers faced at El Rio are consistent with those at the national level (M. Jansky, personal communication, February 21,

2024). However, the substantial number of people experiencing homelessness is unique to this site. Although the available data do not provide the specific percentage of homeless patients, it is noted that more than 76% of the patients who utilize services at El Rio fall at or below the federal poverty line (El Rio, 2022).

Intended Improvement

Project Purpose

This quality improvement (QI) project aims to increase provider awareness and knowledge of the barriers and challenges homeless individuals face in accessing CRC screening and promote positive health outcomes in this population. The goal is to deliver a simple and informative educational video about CRC screening to the providers of people experiencing homelessness of average risk aged 45-75 at a local health clinic in Tucson, AZ.

Project Question

In healthcare providers who care for homeless persons, will education on the barriers and challenges faced by this patient population influence providers' understanding of this issue and willingness to conduct CRC screenings with their homeless patients?

Project Objectives

This QI project aims to increase CRC screening awareness within the health clinic of this FQHC. The proposed QI project includes the following objectives:

- Create an educational video addressing the barriers and challenges homeless patients face in obtaining CRC screening.

- Present an educational video for providers of patients experiencing homelessness to increase provider knowledge and awareness of this population's needs and barriers to CRC screening.
- Conduct a pre- and post-survey questionnaire to assess the understanding gained and willingness to provide CRC screening to homeless patients.
- Present aggregate results to the providers at their monthly staff meeting.

Theoretical Framework

The Health Belief Model

When healthcare providers are educated on the challenges faced by individuals experiencing homelessness, their willingness to perform CRC screenings for these patients can be positively impacted. It is vital to understand the factors influencing health behaviors to succeed. Therefore, this project is based on the Health Belief Model (HBM), which was developed by social scientists at the US Public Health Services (USPHS) in the 1950s to identify why people do not adopt disease prevention strategies or screening tests for early disease detection (LaMorte, 2022). At the time, socioeconomic status, gender, ethnicity, and age were associated with health-related behavior patterns and the use of health services (Abraham & Sheeran, 2015, p. 31). The USPHS scientists hypothesized that educational interventions could change health-related behavior patterns and thus shift health behavior patterns at the population level (Abraham & Sheeran, 2015, p. 31). In 1974, Rosenstock proposed using the HBM as a theoretical framework for understanding how people make health-related decisions. The HBM has been applied as a theory of health behavior in three broad areas: (1) preventive health behaviors, including fecal occult blood and CRC; (2) sick role behaviors related to adherence to

recommended medical treatments; and (3) clinic use including provider visits for a variety of reasons (Abraham & Sheeran, 2015, pp. 32-34). Research indicates that the HBM can help clarify facilitators and barriers to CRC screening in the general population and be used to direct customized interventions to improve colorectal cancer screening and adherence to recommendations such as FIT or FOBT (Lau et al., 2020).

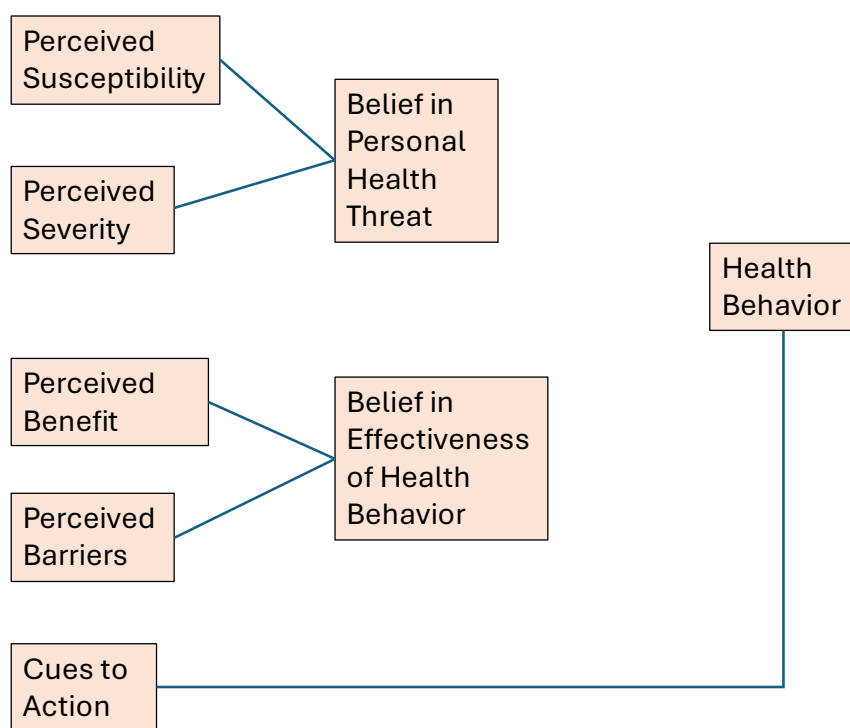
The HBM identifies six key factors that predict health behavior: perceived susceptibility, perceived severity, benefits to action, barriers to action, self-efficacy, and cues to action (Jones et al., 2015). *Perceived susceptibility* is influenced by an individual's belief that they are at risk of adverse health outcomes (Jones et al., 2015), such as a homeless person's level of belief that they are at risk for CRC. *Perceived severity* considers how serious these outcomes may be. In the homeless population, failure to acknowledge the severity of CRC outcomes can lead to high morbidity and mortality, especially considering the barriers this population faces to healthcare access. *Benefits to action* refer to the positive results a person expects from adopting healthy behaviors. Higher perceived susceptibility and benefits are two factors commonly associated with screening intention or behavior, suggesting that individuals are more likely to undergo CRC screening when they not only perceive themselves at risk of CRC but also see the benefit of screening (Lau et al., 2020). In contrast, *barriers to action* are obstacles that may hinder them from doing so, be they practical or psychological (Jones et al., 2015), such as the logistical trust-based barriers experienced by members of the homeless population. *Self-efficacy*, (i.e., confidence in one's ability to make and maintain healthy choices), is crucial, as individuals who feel capable of making positive changes are more likely to take action (Jones et al., 2015). This internalized capability informs *cues to action*, encouraging people to act toward better health

(Jones et al., 2015). Cues to action associated with CRC screening adherence have been found to be influenced by both providers' recommendations to screen and advice to screen from family and friends (Lau et al., 2020). Also, educating providers on the importance of and barriers to screening this population serves as a cue to action itself.

These findings emphasize the provider's vital role in advising patients to adhere to screening. The HBM can be a valuable tool in designing provider education on the barriers to accessing CRC screenings faced by people experiencing homelessness. Through HBM-informed education providers can be empowered to address this vulnerable population's unique needs and barriers, improve trust, and enhance CRC screenings (Figure 1).

Figure 1

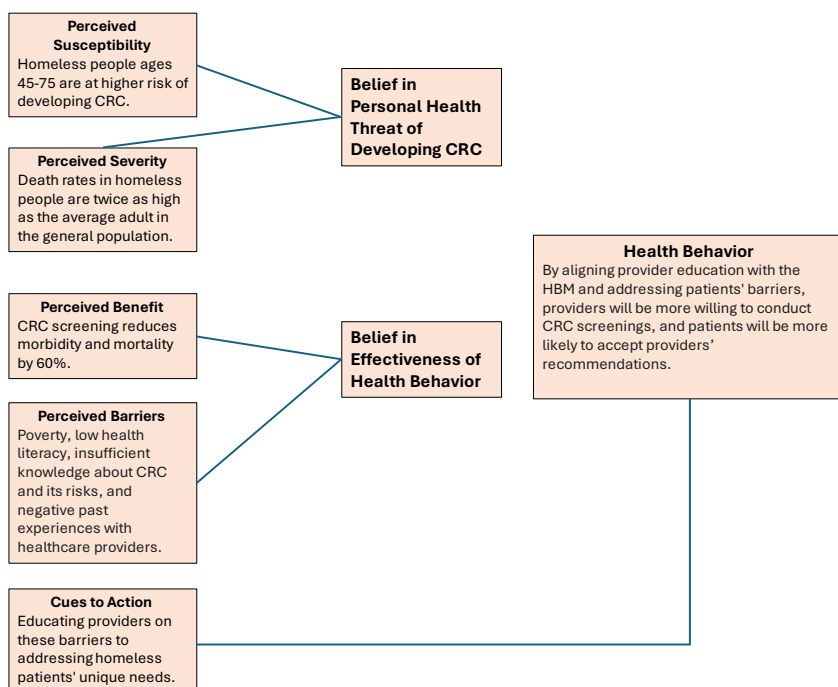
The Health Belief Model



The homeless population faces distinct obstacles when it comes to accessing CRC screening. These challenges stem from poverty, low health literacy, insufficient knowledge about CRC and its risks, and negative past experiences with healthcare providers (Schwartz et al., 2022). Educating providers about these barriers is crucial to enhancing their understanding of the unique needs of these patients. Effective communication that builds trust and rapport with patients, tailored approaches that emphasize the benefits of CRC screening without exacerbating fears, and creating a welcoming environment that treats all patients respectfully and fosters trust should be included in provider education (Schwartz et al., 2022). Aligning the HBM with provider education ensures a patient-centered approach that acknowledges barriers, promotes understanding, and encourages homeless patients to prioritize CRC screening despite their unique challenges. Finally, to reach homeless patients and remove financial barriers, education should also include outreach programs that provide low or no-cost screening tests (Lanese et al., 2021). By aligning provider education with the HBM and addressing these patients' barriers, providers will be more willing to conduct CRC screenings (Figure 2).

Figure 2

The Health Belief Model for Educating Providers on Barriers Affecting Homeless Patients when Conducting CRC Screening



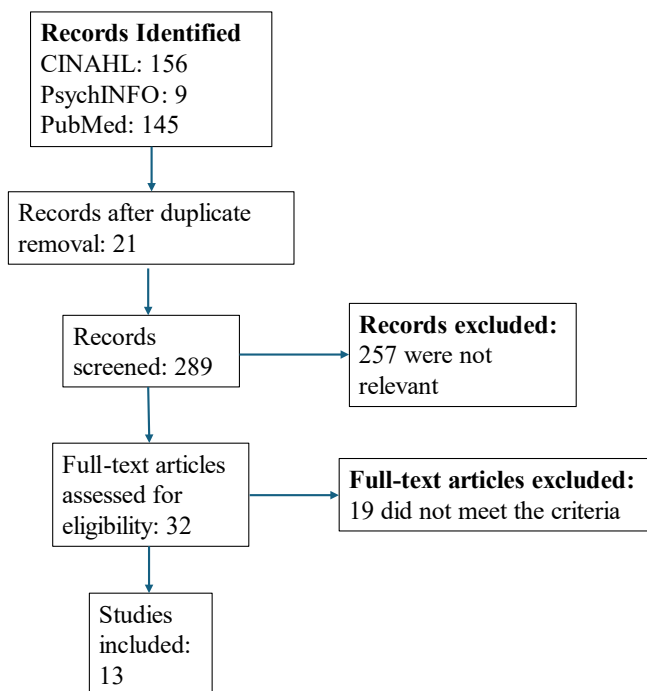
Adapted from <https://www.wendangwang.com/doc/d188859db38b7b077e55399b/2>

Literature Synthesis

Evidence Search

A comprehensive literature review explored current practices of CRC screening in homeless persons, screening tools, and video-based education for providers in a family practice setting. The Arizona Health Sciences Library was used to search PubMed, PsychINFO, and Cumulative Index of Nursing and Allied Health Literature (CINAHL) databases that specified studies published between 2014 and 2024. The reproducible search strategy employed varying combinations of the terms “colorectal cancer screening guidelines,” OR “colon cancer

screening,” AND “homeless,” OR “homeless,” AND “health disparities,” AND “risks,” OR “predictors,” AND “barriers,” AND “financial incentive,” AND “educational video.” The Boolean operator was used for all search terms. The search strategy focused on locating articles specific to CRC screening and recommended procedures, an educational video on CRC screening and recommendations for healthcare providers of homeless individuals, and incentives to increase CRC screening among this population. Educational videos were included, regardless of the intended reason or subject. Incentives to improve CRC screening were also included, regardless of the type of incentive (i.e., cash, gift cards, or reduced co-payments). The following data were extracted from each eligible study: year of publication, homeless population, colorectal cancer screening, FIT kits, barriers, strategies to facilitate CRC screening and educational videos, and comorbidities including diabetes mellitus (DM), hypertension, alcohol and substance use, and mental illnesses. Three hundred ten articles were retrieved; PubMed yielded 145 articles, PsychINFO yielded 9, and CINAHL yielded 156. Reasons for exclusion included pediatric study subjects, irrelevant articles, articles in a language other than English, and articles older than five years. Thirteen studies met the inclusion criteria and were included in the final analysis: four systematic reviews, one project evaluation, two qualitative studies, one cohort study, two quantitative studies, one descriptive research, one exploratory retrospective analysis, and one case report (Figure 3).

Figure 3*PRISMA Flow Diagram***Comprehensive Appraisal of Evidence**

Four themes related to the homeless patient population emerged from the literature review, which need to be addressed in provider education: lack of patient access to healthcare, lack of patient trust in providers, competing priorities experienced by patients, and approaches providers can take in educating their patients.

Lack of Patient Access to Healthcare

Efforts to address the lack of access to CRC screening in people experiencing homelessness are supported by literature demonstrating that programs that provide funding for FQHCs, such as Medicaid expansion, are available. It is essential for providers to be aware that

proximity to healthcare facilities, transportation, lack of health insurance, high cost, and referrals to gastroenterologists are barriers homeless patients encounter (Asgary, 2018; Huang et al., 2017; Schwartz et al., 2022; Thorndike et al., 2022). These barriers prevent patients from receiving the colorectal interventions that they need in addition to preventive care and treatment for chronic conditions, leading to worse health outcomes. Consequently, this population experiences higher hospitalization and mortality rates than the general population (Asgary, 2018; Huang et al., 2017; Schwartz et al., 2022; Thorndike et al., 2022). In a case report, Schwartz et al. (2022) demonstrate that this population faces a high burden of chronic diseases, including CRC. Thorndike et al. (2022), in their qualitative study, provided evidence of untreated mental illness and untreated substance use disorder in the homeless population, which might contribute to noncompliance. Asgary (2018) noted, in their systematic review, that CRC is among the most common causes of mortality in homeless adults.

Addressing this group's complex needs is vital to completing CRC screening and improving outcomes. To help these patients manage the lack of transportation and the cost of accessing healthcare, Thorndike et al. (2022) recommend expanding clinical outreach programs to provide healthcare to homeless people where they are and train clinic staff to treat patients with respect. Lanese et al. (2021) point out that the HRSA Health Center Program provides funding to Health Care for the Homeless (HCH) projects that provide primary care, substance abuse services, emergency care, outreach, and assistance for housing services. This exploratory retrospective analysis demonstrated that the expansion of such services has a positive association with increased medical services utilization. From the health provider's standpoint, awareness of resources such as the preceding services is part of addressing their homeless patients' needs.

Lack of Patient Trust in Healthcare Providers

Primary care providers are vital to CRC screening in vulnerable populations such as people experiencing homelessness. They can influence their patients' screening behavior and preferences by providing education on the importance and benefits of CRC screening, engaging patients in informed choices about the screening options, and addressing concerns. However, establishing a trusting relationship with this group is challenging due to factors such as high provider turnover, low rates of provider recommendation, and limited health literacy (Asgary, 2018; Huang et al., 2017; Schwartz et al., 2022; Thorndike et al., 2022). As the literature demonstrates, these factors create knowledge gaps, further contributing to low screening rates. Asgary's (2018) systematic review found that homeless people are concerned about their risk of cancer and view cancer screening as a priority. Conversely, providers have demonstrated biases against or misconceptions about these individuals and their medical needs or have expressed feeling incapable of responding to their specific social and preventive care challenges (Asgary, 2018; Huang et al., 2017; Schwartz et al., 2022; Thorndike et al., 2022). Therefore, interventions to increase CRC screening in this population should address the barriers at multiple levels, such as improving clinician awareness and recommendations, offering low-cost and non-invasive screening tests, and providing healthcare system navigation and follow-up services (Asgary, 2018; Huang et al., 2017; Schwartz et al., 2022; Thorndike et al., 2022).

Competing Priorities Experienced by Patients

To improve CRC screening rates among homeless populations, healthcare providers must recognize these individuals' competing priorities, preventing them from gaining access to screening or causing them to decline screening when recommended. Urgent needs such as

housing, food insecurity, clothing, physical injury and disability, mental illness, and substance use disorder contribute to suboptimal adherence to CRC screening (Baggett et al., 2015; Huang et al., 2017; Ioannou et al., 2018; Schwartz et al., 2022; Thorndike et al., 2022). These needs make both screening and follow-up challenging. In addition, preparing for and undergoing screening tests, especially colonoscopies, is often unfeasible due to structural barriers such as access to private spaces to complete bowel preparation (Baggett et al., 2015; Huang et al., 2017; Ioannou et al., 2018; Schwartz et al., 2022; Thorndike et al., 2022). Navigating these competing priorities requires a holistic approach considering the whole person, their circumstances, and their unique challenges. Providers can contribute to increasing CRC screening rates and overall well-being by tailoring interventions to the specific needs of this population.

Approaches Providers Can Take in Educating Their Patients

Current research has explored interventions that can enhance providers' understanding and empathy in relation to the barriers faced by homeless individuals, potentially leading to improved CRC screening rates. Evidence-based interventions, such as small media and provider assessment and feedback, have been used effectively (Portela Dos Santos et al., 2022; Katz et al., 2009). Educational materials like brochures, posters, or videos provide visual aids for providers, and regular assessments of providers' knowledge and practices related to CRC screenings help identify areas of improvement (Huang et al., 2017; Kumm et al., 2021; Portela Dos Santos et al., 2022). To address the nature of competing priorities, Huang et al. (2017) in their systematic review, Schwartz et al. (2022) in their case report, and Thorndike et al. (2022) in their qualitative study recommend outreach programs and collaboration with community organizations that offer low or no-cost healthcare services and flexible scheduling to homeless individuals to enhance

access to screening services. Facciorusso et al.'s (2021) systematic review and meta-analysis, Mehta et al.'s (2021) randomized trial and Hardin et al.'s (2020) quantitative study at an FQHC site found that offering patients small financial incentives when promoting interventions such as FIT or FOBT testing was associated with an increase in CRC screening. This multifaceted approach, combining education, reminders, and support services, can empower providers to overcome barriers and improve CRC screening rates among patients experiencing homelessness.

Strengths of Evidence

The literature review included four systematic reviews and nine recent articles from 2020-2022. The systematic review conducted by Asgari (2018) included 21 articles that met the inclusion criteria, while the systematic review and meta-analysis conducted by Facciorusso et al. (2021) included eight randomized controlled trials involving 110,644 participants. Several strengths related to provider education for increasing CRC screening awareness among homeless populations have also been identified. First, the literature provides insight into the competing priorities, such as food insecurity and comorbidities, that prevent this population from accessing or accepting CRC screening (Baggett et al., 2015; Huang et al., 2017; Ioannou et al., 2021; Lanese et al., 2021; Schwartz et al., 2022; Thorndike et al., 2022). Second, based on a clear understanding of these priorities, multi-component interventions, such as provider reminders and education, have been found to effectively increase the CRC screening participation rate of people experiencing homelessness (Huang et al., 2017; Ioannou et al., 2017; Katz et al., 2009; Kumm et al., 2022; Portela Dos Santos, 2022). Third, the literature has consistently found that healthcare providers are crucial in educating homeless patients about CRC screening recommendations and testing options (Huang et al., 2017; Ioannou et al., 2017; Katz et al., 2009; Kumm et al., 2022;

Portela Dos Santos, 2022). Fourth, patient incentive programs can help improve CRC screening uptake among homeless populations (Facciorusso et al., 2021; Hardin et al., 2020; Mehta et al., 2021). Therefore, the literature agrees that an approach involving providers, community awareness, and tailored interventions can contribute to successful CRC screening among homeless individuals.

Weaknesses of Evidence

While evidence supports the effectiveness of interventions, many studies do not adequately account for the complexity of homelessness due to small population size or lack of high-quality studies. Economic, social, and health-related factors demand comprehensive solutions that provider education efforts must consider when tailoring interventions accordingly (Asgary, 2018; Baggett et al., 2015; Huang et al., 2017; Ioannou et al., 2021; Lanese et al., 2021; Schwartz et al., 2022). However, implementing evidence-based studies consistently is challenging due to resistance from healthcare professionals, resource constraints, and competing priorities. Furthermore, ways to ensure the long-term sustainability of provider education about this patient population are not explored. Lastly, suitable strategies to address barriers faced by homeless populations are not widely integrated into existing research (Asgary, 2018; Baggett et al., 2015; Huang et al., 2017; Ioannou et al., 2021; Lanese et al., 2021; Schwartz et al., 2022).

Gaps and Limitations

Research focusing on homeless populations is still limited, with most studies concentrating on general populations. Consequently, the distinct challenges faced by these individuals are not fully addressed. Significant evidence supports multicomponent interventions, such as provider reminders and education, enhanced access, and patient education, to promote

CRC screening participation among people experiencing homelessness. However, it is necessary to adapt existing practices to make these interventions a routine part of primary care delivery. The literature does not offer explicit guidance on effectively educating this population about CRC screening. While studies have focused on short-term outcomes, sustaining higher CRC screening rates over the long term poses a challenge. Nonetheless, it is crucial to comprehend the durability and impact of educational interventions beyond the study period.

METHODS

Project Design

Research suggests that educating PCPs at the project site about the unique barriers and challenges faced by homeless individuals can increase their willingness to perform CRC screenings for this vulnerable population. To explore this further, QI and intervention design involving an educational program was implemented. By addressing these barriers, primary care providers (PCP) can enhance their knowledge and awareness of the challenges faced by homeless individuals and promote positive health outcomes through evidence-based practices. The project was voluntary for PCPs at the FQHC, and the PI provided a pretest to assess their knowledge of these challenges. Following the initial assessment, the PI provided education through a video, and participants completed a posttest to evaluate their willingness to conduct CRC screenings.

Model for Implementation

The Institute for Healthcare Improvement (IHI) has adopted the Model for Improvement, created by Associates in Process Improvement, as a framework for healthcare improvement. This straightforward framework allows for rapid change. The model consists of three questions

addressing what is being accomplished, if the change is an improvement, and what change can be made to result in an improvement (IHI, n.d.).

Plan-Do-Study-Act (PDSA) Cycle

The Plan-Do-Study-Act (PDSA) cycle tests and adapts changes by cycling through the three questions. For this QI project, the PI aimed to increase provider awareness of the barriers and challenges homeless patients face to access CRC screenings at El Rio Health Center. The ultimate goal was to improve CRC screening in this population. The success of the change was determined by evaluating providers' comprehension of these barriers and challenges and measuring their willingness to conduct CRC screenings post-education. The solution to improve this process was creating a targeted educational video for providers, focusing on homeless patients' needs and barriers, and enhancing provider cultural competence.

Plan

The project question was formulated to develop the change plan, and the project was planned accordingly. The resulting QI project plan involved creating an educational video for PCPs at the FQHC. This video aimed to increase providers' awareness about homeless patients' challenges and barriers to accessing CRC screening. The PI intended to determine whether this educational intervention affected the providers' willingness to conduct CRC screenings for these patients.

Do

To effectively introduce the educational intervention, a pretest was administered to assess the providers' knowledge of homeless patients' unique challenges. The pretest delved into the providers' attitudes toward performing CRC screenings for this patient population. The pretest

was an essential tool in determining if the providers were knowledgeable about the health needs of homeless patients and their willingness to screen these individuals. The second phase of the intervention entailed an educational video that delivered targeted education to healthcare providers, emphasizing these barriers to raise their awareness and empathy. By recognizing specific needs, providers can be encouraged to offer preventive services and cultivate trust, patience, and respectful communication with patients. The education expanded to clinical outreach and health education programs to bridge the gap between providers and homeless patients. Finally, the third step consisted of a posttest or survey to assess the providers' understanding of this issue and willingness to provide CRC screening.

Study

The first stage of analysis examined the pretest results and the providers' comprehension of the challenges faced by homeless patients when accessing CRC screening. The second analysis evaluated the posttest results and the providers' preparedness to offer CRC screening to this demographic. Lastly, the third analysis compared the pretest and posttest outcomes to gauge the effectiveness of the intervention.

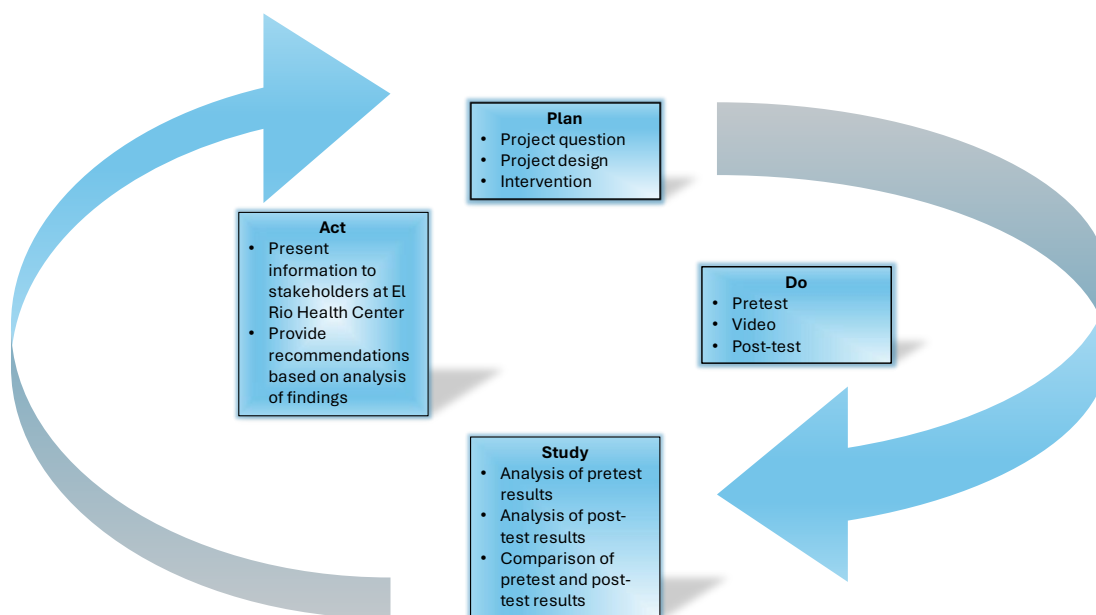
Act

Recommendations were made to El Rio Health Center based on the primary care providers' response to the education relative to understanding of barriers and their willingness to integrate screening in this population. These recommendations included establishing an educational program for healthcare providers that addresses the specific concerns related to CRC screening for homeless patients. Collaboration among providers, social workers, and community organizations was recommended so that providers could work closely with case managers,

shelters, and outreach teams to enhance CRC screening. Regular team meetings can facilitate information sharing and problem-solving.

Figure 4

PDSA Cycle for Educating Providers on Barriers to CRC Screening Faced by Homeless Patients



Setting and Stakeholders

This project was conducted in partnership with El Rio Health Center, a healthcare organization offering the community reliable, affordable, compassionate care. The PI obtained prior authorization from El Rio Health’s Quality Data System (QDS) to ensure compliance (Appendix A). The project focused on PCPs who provide care to homeless patients between the ages of 45 and 75 and who require CRC screening by USPSTF guidelines.

The key stakeholders of El Rio Health Center are the primary care providers and homeless patients. By recognizing the obstacles to CRC screening, providers can make better-informed choices about caring for these patients. Customizing communication to satisfy patients’

requirements, establish trust, and reinforce the patient-provider relationship is crucial. These improved screening methods ultimately lead to early detection and better health outcomes.

Planning the Intervention

The QDS team at El Rio Health Center compiled a comprehensive list of potential participants, which included their names and email addresses. Eligible participants were sent an email inviting them to access an educational video that addresses the challenges homeless patients face with CRC screening. The email sent to participants included the project disclaimer and clear instructions on completing the pretest, watching the educational video, and completing the posttest within two weeks. Electronic links to both surveys and the video presentation were placed at the bottom of the email for participants to access directly. The PI sent a follow-up email to participants who had not responded within the given timeframe via Qualtrics, as these emails can be sent without PI knowledge of which potential participants they went to.

The pretest survey was comprised of twelve questions addressing demographic information, knowledge, and awareness of the importance of CRC screening in the homeless population, barriers and challenges of screening, attitudes and willingness to screen, and system-level factors impacting screening (Appendix D). The educational video delved into the critical components necessary to effectively communicate the importance of understanding the challenges and barriers faced by those experiencing homelessness. Specifically, the content examined the unique healthcare needs and obstacles to medical care that homeless individuals face, including mental illness, physical injuries, food insecurity, and substance use disorders. Additionally, the video explored the barriers to accessing care and preventive screenings, such as negative past healthcare experiences and competing priorities for survival. The education also

highlighted how healthcare providers' knowledge of these factors can influence their willingness to conduct colorectal cancer CRC screenings for homeless populations. Ultimately, the video aimed to underscore the impact of education on healthcare providers' attitudes and practices surrounding CRC screening for those experiencing homelessness. The posttest incorporated eight questions related to a new understanding of the importance of CRC screening, barriers and challenges of screening, attitudes and willingness to screen, and system-level factors impacting screening (Appendix D).

Participants and Recruitment

The projected sample size included in the project was nine primary care providers who work at El Rio Health Center and care for homeless patients (M. Jansky, personal communication, March 14, 2024). This FQHC operates various clinics in Tucson, Arizona, specifically dedicated to providing essential healthcare services to homeless individuals. Some clinics where these providers work include El Rio Cherrybell Health Clinic and El Rio Broadway Clinic. Additionally, El Rio Medical Outreach Teams provide care to people experiencing homelessness through the “Van of Hope” mobile medical van at locations such as men’s and women’s shelters, churches, and soup kitchens. Lastly, El Rio collaborates with Gospel Rescue Mission, La Frontera Arizona, and the Department of Economic Security to provide on-site services for individuals experiencing homelessness (The HS Lopez Family Foundation, n.d.). Potential participants were recruited through an email outlining the purpose of the project, the role of PCPs, and the benefits of participation (Appendix C).

Consent and Ethical Considerations

This project upheld the principles of beneficence, respect for human dignity, and justice established by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research in the Belmont Report (HHS, 2022). To uphold the ethical principle of beneficence, educating healthcare providers about the barriers and challenges the homeless population faces equipped them to provide more effective and compassionate care. Participation in the professional development educational intervention carried minimal risk, and participants were not exposed to any harm. All individuals had the right to self-determination and were fully informed about the intervention, according to respect for human dignity. Participants received a disclaimer form (Appendix B) describing the project. Lastly, justice was established by maintaining the participants' privacy and treating all participants fairly. Survey data was deidentified, securely stored on a password-protected computer and Excel file, and only accessible by the PI. This project underwent review and approval by the University of Arizona's IRB for human subject research (Appendix A), ensuring its ethical and responsible implementation.

Data Collection

The data was collected using a pretest/posttest design following the educational intervention. The pre-survey included 12 multiple-choice questions. Four pre-survey questions captured the primary demographic characteristics of the provider population, including gender, age, years of experience as a PCP, years of experience working with homeless patients, and practice settings. The answer options for these questions were categorical multiple choice. The 8 remaining assessed the same variables in both surveys (pretest & posttest). Two questions

focused on provider perceived knowledge of barriers and challenges homeless people face in accessing healthcare and CRC screening. One question targeted the provider's perception of social determinants of health's impact on CRC screening rates. Two questions assessed the provider's likelihood to initiate conversations about CRC screening with patients and their preparedness to address barriers homeless patients face. One question focused on the provider's perception of the importance of tailoring CRC screening discussions to the needs of homeless patients. The last two questions determined how often providers currently conduct CRC screening and how willing they are to conduct CRC screening for these patients. These questions were written in a retrospective pretest and posttest format to capture the difference in the providers' responses before and after completing the education, and they were presented in a Likert-scale format. The answer choices ranged from strongly disagree (1) to strongly agree (5). Each survey also contained a comments section for participants to include any comments or feedback they had. The PI utilized the work done by Sullivan and Artino (2018) to guide the creation of the survey, which a supervisory committee reviewed.

The survey was conducted through the University of Arizona's Qualtrics online platform. To ensure privacy, the participants did not enter identifiable information when completing the pretest and posttest, and no identifiable email was associated with the results in Qualtrics. The PI and the supervisory committee chairperson were the only ones with access to the results of each survey. Upon project completion, the data was stored securely in a password-protected computer by the PI for six years.

Data Analysis

The PI analyzed the data using the University of Arizona's Qualtrics online platform and Microsoft Excel. The data obtained from the pretest/posttest survey was categorical or ordinal, and each question corresponded to one or the other variable. The categorical variables were represented in bar charts to demonstrate the distribution and relative frequencies of the data. The ordinal data were presented in frequency distribution tables to provide insight into each possible value's occurrence and corresponding frequencies. The following is a list of the variables:

- Age group (categorical)
- Years of practice as a primary care provider (categorical)
- Years of working with homeless individuals (categorical)
- Current practice setting (categorical)
- Ability to identify barriers in accessing CRC screening, pre- and post-education (ordinal)
- Knowledge about challenges when seeking healthcare, pre- and post-education (ordinal)
- Significance of social determinants of health on CRC screening rates, pre- and post-education (ordinal)
- Likelihood to initiate conversations about CRC screenings, pre- and post-education (ordinal)
- Preparedness to address and overcome the barriers homeless patients face in obtaining CRC screenings, pre- and post-education (ordinal)

- Importance of tailoring CRC screening discussions to the unique needs of homeless individuals, pre- and post-education (ordinal)
- Frequency of conducting CRC screenings for homeless patients compared to housed patients, pre- and post-education (ordinal)
- Willingness to conduct CRC screenings for homeless persons, pre- and post-education (ordinal)

RESULTS

This quality improvement and professional development project was implemented over a two-week period. The PI sent out the initial recruitment email (Appendix C) using the University of Arizona's Qualtrics online platform on May 31, 2024, followed by a second recruitment email in the same format on June 7, 2024. The project was closed to participants on June 14, 2024. While the project did not achieve the desired number of participants, it provides a valuable learning experience and highlights areas for improvement in future projects.

The study initially aimed to include seven nurse practitioners and two physicians, for a total of nine participants. However, only two providers chose to participate, highlighting a potential area for improvement in future projects. Participation was conducted anonymously through the Qualtrics website, as indicated in the recruitment email. Each provider voluntarily decided to participate after reviewing the recruitment email and meeting the inclusion criteria. Participants accessed the disclosure (Appendix B) by following the website link in the recruitment email. Subsequently, each participant independently engaged with the educational materials (Appendix D & E), which comprised a pretest, an educational presentation by the principal investigator, and a posttest. The participants completed the pretest, followed by the

educational presentation, and concluded with the retrospective posttest available on the Qualtrics webpage. Participants had ample time to complete each intervention component, and the principal investigator was reachable throughout the two weeks. However, no participants reached out, and no modifications were made to the intervention during this period. Only one participant completed the entire intervention, while another completed the educational presentation and the posttest. One participant initiated the pretest but did not finish the entire survey. Consequently, this partial response was excluded from the analysis, resulting in a final sample size of two primary care providers.

Outcomes

According to the demographic data gathered from the pretest, one participant is aged between 40 and 54, has been working as a primary care provider for 5-10 years, has been involved in caring for homeless individuals for 5-10 years, and typically provides care for homeless individuals in a non-traditional setting labeled as “other” in the pretest. The survey section using a retrospective pretest and posttest format consisted of eight questions with response options rated on a 5-point Likert scale. The responses indicated the level of agreement, with ‘1’ representing “strongly disagree” and ‘5’ representing “strongly agree.”

One crucial objective of this quality improvement and professional development project was to educate providers on the significant challenges and barriers homeless individuals face when accessing CRC screening services. This objective, aimed at improving the quality of care for this vulnerable population, underscores the importance of this project. When examining questions in the surveys pertaining to this objective, there is a positive response from the participants. In the pretest, the participant neither agreed nor disagreed. However, as indicated in

Figure 5, both participants agreed they felt confident identifying barriers homeless patients face in accessing CRC screening after completing the education. There was an increase in the level of agreement post-education regarding the likelihood of initiating conversations about CRC screening with homeless patients, as demonstrated by Figure 6. Interestingly, one participant neither agreed nor disagreed with the statement about feeling prepared to address and overcome the barriers homeless patients face in obtaining CRC screening. In contrast, the other participant strongly agreed with this statement (Figure 7).

Figure 5

Response Frequency for Knowledge of Barriers Faced by Homeless Patients

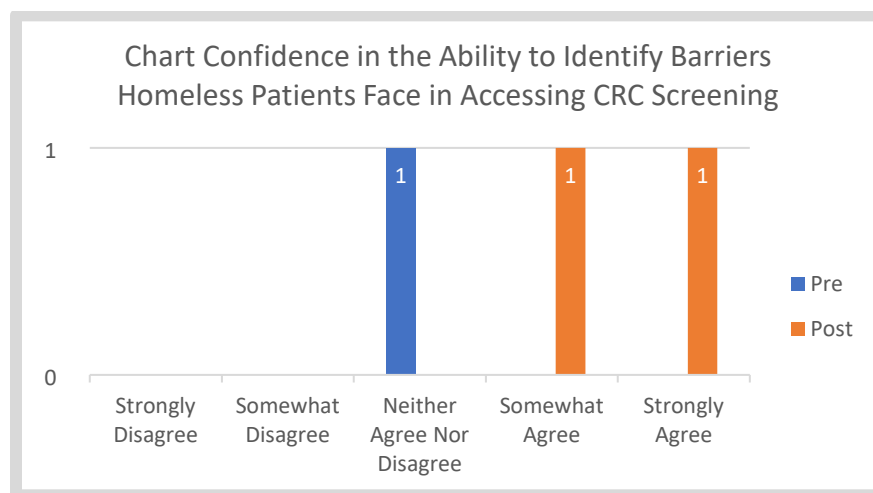


Figure 6

Response Frequency for the Likelihood to Initiate Conversations About CRC Screening with Homeless Patients

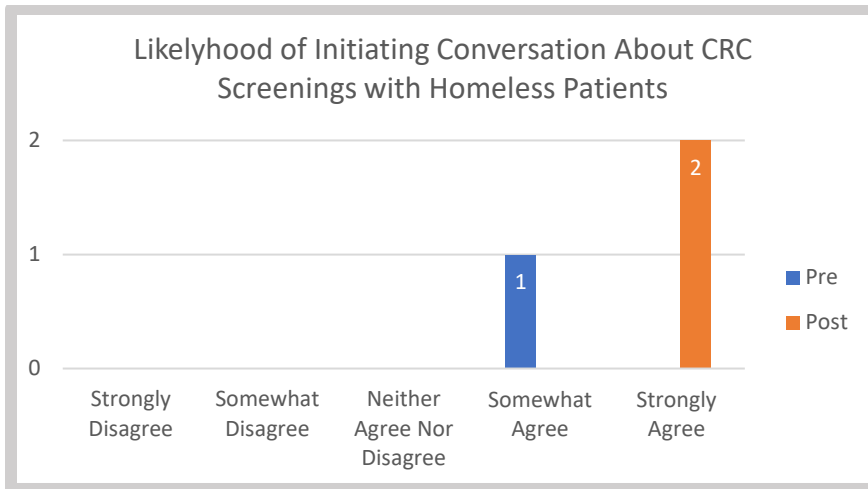
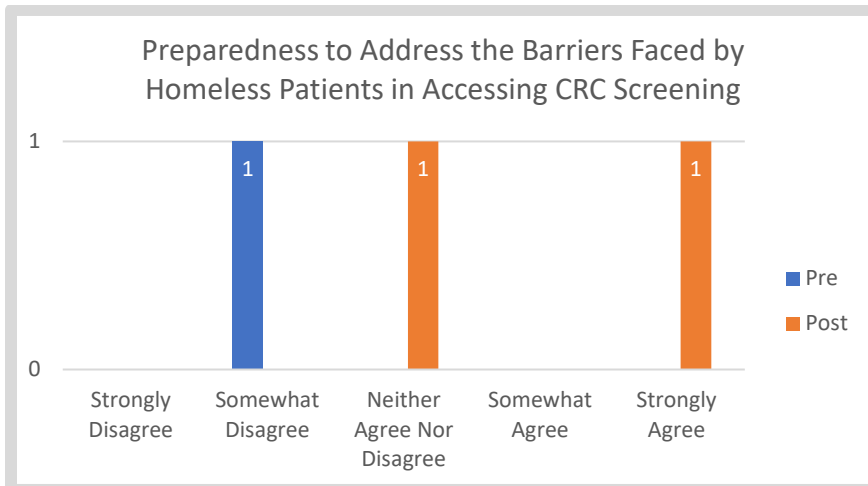


Figure 7

Response Frequency for the Preparedness to Address Barriers Faced by Homeless Patients in Accessing CRC Screening



The second objective of this project was to assess the understanding gained and determine if the providers' willingness to provide CRC screening to homeless patients increased after completing the educational intervention. This objective was measured by asking participants about the importance of tailored CRC screening discussions and their willingness to conduct CRC screening for homeless patients. Figure 8 shows the frequency of responses to the question about the importance of tailoring CRC screening discussions to the unique needs of homeless individuals. In contrast, Figure 9 depicts the frequency of responses to the question about the providers' willingness to conduct CRC screening for homeless patients. As shown in Figure 8, all participants strongly agreed with the importance of tailored CRC screening, and this opinion was reflected in both the pretest and the posttest. Additionally, all participants strongly agreed with the statement concerning their willingness to conduct CRC screening for homeless patients in both the pretest and the posttest.

Figure 8

Response Frequency for the Importance of Tailoring CRC Screening to the Unique Needs of Homeless Patients

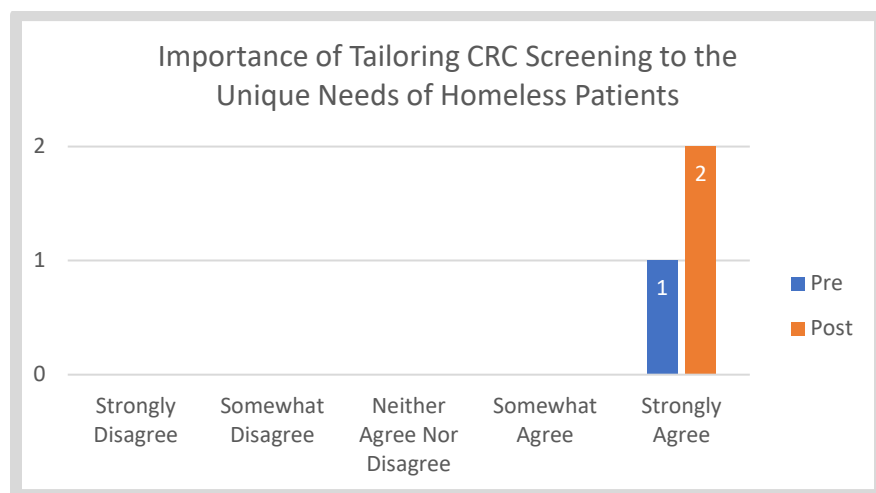
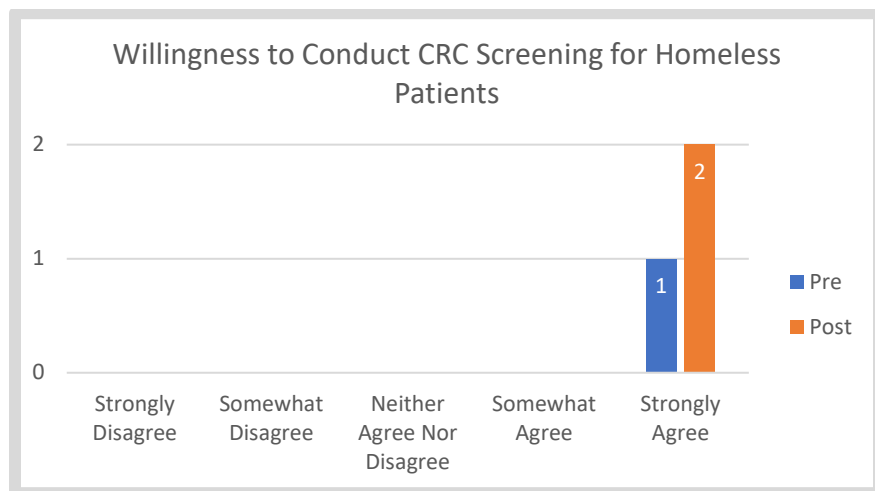


Figure 9

Response Frequency for the Willingness to Conduct CRC Screening for Homeless Patients



To further illustrate the findings from five of the questions using the retrospective pretest and posttest format, Table 1 presents the median and mean scores based on the 5-point Likert scale answers.

Table 1

Descriptive Statistics for Retrospective Pretest and Posttest Likert Scale Questions

| | Pre (n=1) | | Post (n=2) | |
|--|-----------|-------------------|------------|-------------------|
| | Mean | Median (min, max) | Mean | Median (min, max) |
| 1. How much do you agree with this statement? I feel confident in my ability to identify barriers homeless patients face in accessing CRC screenings. | 3 | 3 | 4.5 | 4.5(4,5) |
| 2. How much do you agree with this statement? I am likely to initiate conversations about CRC screenings with my homeless patients. | 4 | 4 | 5 | 5(5,5) |
| 3. How much do you agree with this statement? I feel prepared to address and overcome the barriers homeless patients face in obtaining CRC screenings. | 2 | 2 | 4 | 4(3,5) |
| 4. How much do you agree with this statement? I think it is important to tailor CRC screening discussions to the unique needs of homeless individuals. | 5 | 5 | 5 | 5(5,5) |
| 5. How much do you agree with this statement? I am willing to conduct CRC screenings for homeless persons. | 5 | 5 | 5 | 5(5,5) |

The median scores showed minimal change for the different measures from the pretest to the posttest, except for one question. Table 1 indicates a one-and-a-half-point median score increase for number one and a one-point increase for number two. However, there was a two-point increase for number three. These changes correspond to the understanding of barriers, initiation of conversations about CRC screening, and preparedness to address barriers homeless patients face in obtaining CRC screening. There was no change for questions four and five. These questions correspond to the importance of tailored CRC screening and the willingness to conduct CRC screening.

DISCUSSION

Summary

In the US, 3.5 million people experience homelessness each year, with men aged 45-54 being the most at-risk population (Asgary, 2018). In Pima County, 2,209 people in 1,666 households experience homelessness on an average night (City of Tucson, 2023). This age group also requires appropriate colorectal cancer screening (CRC screening), as CRC is the third most common and the second most fatal cancer in men and women (Dlugasch & Story, 2021, p. 444). CRC screening reduces morbidity and mortality by 60% (American Cancer Society, 2024). However, homeless populations often face chronic illnesses, untreated mental illness, substance abuse, and a lack of access to primary care, further increasing their risk for CRC (Schwartz et al., 2022). Limited access to healthcare services, low utilization, and a lack of trust in healthcare providers are significant barriers for this population to seek or receive recommended CRC screening (Schwartz et al., 2022). Multiple strategies have been suggested for combating the lack of screening in this population, as the factors contributing to this problem are multifactorial.

Educating providers on the barriers to CRC screening homeless individuals face is crucial to increasing their awareness, providing tailored communication, allowing them to access resources, and implementing multi-component interventions (Schwartz et al., 2022). This education enhances providers' ability to promote CRC screening, improve early detection rates, and ultimately save lives.

This project aimed to educate PCPs at El Rio Health Center who provide care for homeless patients about the barriers to CRC screening that these patients encounter. The education was delivered via a video that addressed these barriers, including the importance of understanding these unique barriers for designing interventions, utilizing resources, and implementing targeted strategies to increase CRC screening rates. Additionally, the project attempted to assess whether this education influenced the providers' understanding of the issue and their readiness to perform CRC screenings for homeless patients.

A key finding of this project was that providers reported a modest increase in their willingness to conduct CRC screenings for homeless patients. After completing the education, 100% of the PCPs stated that they strongly agreed to conduct CRC screenings, versus 0% of providers reporting the same frequency before completing the education. Additionally, the median score for this measure increased by one point from the pretest to posttest scores. This increase in relative frequency and median score regarding providers' willingness to conduct CRC screening for homeless patients represents a strength of this project. Another key finding is that after completing the education, one provider strongly agreed, and another neither agreed nor disagreed with their readiness to address and overcome the barriers homeless patients face in obtaining CRC screening. The median score for this measure was four. However, only 50% of

providers answered the clinical scenario question in the pretest and posttest. Therefore, this low correct response frequency measure is a primary weakness of this project that may be due to the need to address the social determinants of health encountered by this patient population. Other encouraging key findings include that after completing the education, providers had an increase in the level of agreement with their confidence in their ability to identify barriers homeless patients face in accessing CRC screening and the likelihood that they will initiate conversations about CRC screening with these patients. Although there was no change, with a median score of 5, in the response frequency related to the importance of tailoring CRC screening discussions to the unique needs of homeless individuals, the participants strongly agreed with this statement in the pretest and posttest.

Interpretation

This QI project's primary objective and measurable outcome was to determine if providers reported an increased willingness to conduct CRC screening with their homeless patient population due to the education provided by the principal investigator. This measure had a 1-point median score increase from the pretest to posttest scores. However, only half of the participants completed all sections of the intervention. Therefore, this likely affected the degree to which the median score in this measure increased. Furthermore, the ability to address the barriers homeless patients face in obtaining CRC screening was a measure with a 2-point median score increase. Thus, 50% of the participants felt that they were not prepared to address these barriers. However, 100% of the participants felt prepared to address these barriers after receiving the education. It is important to note that the sample included two participants, but only one completed the pretest, educational video, and posttest. The other participant completed the

educational video and the posttest only. This resulted in missing data. There may be several explanations for the intervention's lack of completion, including misunderstanding the education, ineffective instructions, time constraints, or providers working out of different locations. It is difficult to determine where the lapse occurred because the educational intervention was delivered online and completed independently by providers.

The literature reviews various interventions to increase CRC screening in the homeless population. Studies have demonstrated that educating healthcare providers about the challenges faced by this patient group can positively influence their willingness to conduct screenings (Asgari, 2018; Lanese et al., 2021; Schwartz et al., 2022). However, these studies significantly differ in the scope of education provided, the design of educational materials, and the primary outcome measures. These interventions incorporate educational tools such as brochures, posters, videos, regular assessments, and provider assessment and feedback (Huang et al., 2017; Kumm et al., 2021; Portela Dos Santos et al., 2022). Additionally, the interventions are typically implemented over an extended period and often combine education with other forms of intervention. For instance, some studies have included mailing reminders and testing kits to patients' homes, reminder phone calls, pamphlets, patient education, and patient navigators (Schwartz et al., 2022). However, implementing these interventions for the homeless population is not feasible due to the unique challenges associated with homelessness.

Unfortunately, few studies have examined the barriers to CRC screening in homeless people, and none of the literature has examined willingness to increase CRC screening upon understanding these barriers (Asgari, 2018). The screening rate is a better measure for capturing actual behavior in practice rather than measuring willingness or intent to screen. However,

measuring the screening rate would not have been feasible in this quality improvement project. Future projects could focus on implementing education in a healthcare system through which CRC screening for homeless patients could be measured. An important insight from this research indicates that hands-on education, paired with direct feedback to providers, is more effective than passive education. The educational approach used in this project was more passive. It lacked direct contact with the PI, which may have contributed to the observed deficiencies in participant responses to the pretest.

It is noteworthy that providers responded positively to other components of the posttest and expressed support for conducting CRC screening for homeless individuals. They also indicated an improved understanding of the obstacles to accessing CRC screening for this patient demographic, their capability to address these challenges, and their willingness to perform CRC screening. Nonetheless, the median score changes for these indicators only showed a 1-point increase, with a 2-point increase observed for just one measure. This might be attributed to the high baseline scores in much of the sample population.

Implications (Practice, Education, Research and Policy)

The outcomes of this project indicate that implementing an educational video on the barriers homeless individuals face in accessing CRC screening may influence providers' willingness to conduct CRC for this patient population. However, it is difficult to estimate if the reported willingness to screen will translate to a change in practice. It is plausible that those providers who completed the intervention may increase CRC screening for homeless patients. However, the sample size for this project was very small, and it is unlikely that it impacted widespread practice change in the health center where the project was conducted. Education

should be disseminated over an extended period and with a larger sample to create lasting change or significant impact.

The educational intervention effectively increased providers' confidence in identifying the barriers faced by homeless patients, their preparedness to address these barriers, and their willingness to conduct CRC screenings for these patients. However, the limited survey responses make it uncertain if this education was fully effective. Therefore, an important implication of this project is the necessity for continued education to ensure that providers understand these barriers and can tailor CRC screening practices accordingly. Based on the results of this project, it is challenging to determine the existing gaps in the educational preparation of providers regarding the barriers to accessing CRC screening. The educational video was designed for PCPs to access and apply to their practice at their convenience. As a result, participants can refer to it and share it with other providers.

Further research is necessary to gain a deeper understanding of how the education of healthcare providers influences their willingness to conduct CRC screening in vulnerable populations, such as those experiencing homelessness. The limited data obtained was due to a smaller than-intended sample size and the short duration of participation. To improve understanding of the impact of this intervention, a larger sample size, longer project duration, and additional questions aimed at identifying providers' comprehension of the education are essential. Furthermore, the support of leaders within healthcare organizations could potentially lead to a more substantial change in practice and higher CRC screening rates within homeless populations.

This project was carried out at various sites within a health center with limited participants, making it challenging to implement the necessary policy changes based on the project's findings. However, individual providers can utilize the knowledge they have gained to introduce policy changes within their organization to support CRC screening for individuals experiencing homelessness. Educating providers about this population's unique challenges is crucial to advocating for supportive policies within an organization and ensuring the success of CRC screening campaigns for homeless populations (Huang et al., 2017).

Limitations

This quality improvement and professional development project has several limitations. First, the project sample population consisted of nine providers who care for homeless patients at El Rio Health Center. Consequently, the results from this small sample may not be generalizable to the larger population and might not adequately represent the diversity within the population (Etchells & Woodcock, 2018). Furthermore, evaluating the extent to which the intended change has been executed can pose a challenge. This assessment is crucial for comprehending the efficacy of the intervention.

Second, the obtained sample size ($n=2$) was much lower than the intended size of nine participants. Due to the limited number of providers caring for patients experiencing homelessness at El Rio Health Center, additional participants could not have been obtained even with alternative recruitment strategies. This limitation may lead to higher variability and potential bias, ultimately affecting the reliability of the results (Etchells & Woodcock, 2018). Given the sample size and characteristics of the project's population, the obtained results cannot be generalized to a larger population outside the health center, nor can they be considered

representative of all PCPs in the area. Additionally, the small sample size restricts the ability to perform inferential statistics, making it impossible to determine the significance of the results (Etchells & Woodcock, 2018).

Third, the principal investigator (PI) sought to mitigate response-shift bias by employing a retrospective pretest and posttest survey design. Nevertheless, any retrospective evaluation can potentially introduce recall bias, thus impacting the survey's validity (Little et al., 2020). Moreover, the survey developed by the principal investigator was not pilot-tested within this population, which diminishes the reliability of its findings.

Finally, the limited sample size can result in inefficient resource use, as it may not yield sufficient information to warrant resource allocation for more comprehensive implementation (Etchells & Woodcock, 2018). This limitation increases the likelihood of false negatives, where an actual effect goes undetected due to the small sample size's inability to demonstrate it (Etchells & Woodcock, 2018).

DNP Essentials Addressed

The project's implementation aligns with the Doctor of Nursing Practice (DNP) Essentials, established by the American Association of Colleges of Nursing (AACN) in 2006. *DNP Essential I, Scientific Underpinnings for Practice*, is intricately woven throughout the project. The PI employed a theoretical framework based on psychological theory to comprehend and determine whether this understanding would influence behaviors in clinical practice. Drawing from epidemiology, rural health, psychology, and behavioral sciences, the research helped the PI recognize the barriers people experiencing homelessness face in accessing CRC screening and assess the influence of the knowledge gained on providers' willingness to conduct

CRC screening for homeless patients. As a result, the PI integrated science-based concepts from various scientific domains to develop a project to enhance healthcare delivery for a specific condition and population.

DNP Essential III, Clinical Scholarship and Analytical Methods for Evidence-Based Practice, was addressed by critically appraising literature and synthesizing research as part of this project. In addition, the principal investigator utilized the most current evidence to design an educational intervention to enhance primary care providers' practice. Information technology was employed to implement the intervention and gather and analyze data for the project. Finally, by utilizing this essential, the PI focused on the importance of using evidence-based practice to improve the quality of care for people experiencing homelessness.

DNP Essential VIII, Clinical Prevention and Population Health for Improving the Nation's Health, was applied through the problem that this project aimed to address: the influence of provider education on barriers to CRC screening experienced by homeless people on providers' willingness to screen this patient population. The low CRC screening rates are a population health problem that requires healthcare scholars' attention. In implementing this project, the PI attempted to call other providers to action while providing education and strategies for improving preventive care for a specific subset of patients.

Conclusions

The homeless population faces a high risk of CRC, which is the second most fatal cancer for both men and women. Unfortunately, the screening rate for this group is significantly below the average. To address this issue, a quality improvement and professional development project utilized an online educational intervention to provide information about the barriers and

challenges homeless individuals face in accessing CRC screening. The goal was to influence providers' willingness to increase CRC screening for this population. The project's results showed that the education provided increased providers' willingness to conduct CRC screening for these patients. The providers reported a better understanding of the barriers to CRC screening faced by homeless patients and felt better equipped to address and overcome these obstacles. However, the changes in median scores for all outcomes were modest, suggesting that further quality improvement projects or research are needed to fully understand this type of intervention's impact. Additionally, the small sample size and the fact that 50% of providers did not complete all aspects of the educational intervention raise questions about the effectiveness of the education delivered and underscore the need for additional educational efforts.

Plan for Sustainability

The training offered to the primary care providers involved in this project was intended for them to utilize in their practice. After the project results are shared, the PI will also collaborate with the health center's leadership to determine the optimal approach for adapting and redistributing the materials, if permitted. Furthermore, once in practice, the PI will provide the educational materials freely to other providers seeking additional information.

Plan for Dissemination

The results of this quality improvement project will be disseminated through an online poster presentation defense open to all members associated with the University of Arizona College of Nursing. The findings will also be presented at the annual research and innovation summit hosted by the El Rio Health Center.

APPENDIX A
SITE APPROVAL/AUTHORIZATION LETTER

EL RIO

HEALTH

April 1, 2024

Human Subjects Protection Program
The University of Arizona
845 N Park Ave., Suite 537A
Tucson, AZ 85719

To Whom it May Concern,

Ms. Alma Delia Donohue, a University of Arizona Doctor of Nursing Practice student, has the support of El Rio Health Center to conduct a quality improvement project in collaboration with Marketa Jansky, FNP. We are aware and supportive of her project titled: *Enhancing Colon Cancer Screening Among Patients Experiencing Homelessness: Educating Clinicians on Patient Barriers*.

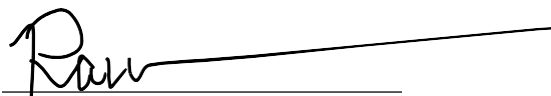
Ms. Donohue will conduct pre- and post-surveys and provide an educational video to healthcare clinicians at El Rio Health Center. She will recruit clinicians through email. The email will provide a description of the project, what the participants will be asked to do, the time involved, and a link to the online surveys and video presentation. Ms. Donohue intends to recruit six (6) clinicians who care for unhoused patients. Ms. Donohue's activities will be completed by October 1, 2024.

Ms. Donohue understands that El Rio Health requires a copy of the University of Arizona IRB determination letter prior to project commencement. Additionally, she is aware of and has agreed to complete our Quality Improvement Project intake process prior to project commencement.

Ms. Donohue has also agreed to present aggregate results to El Rio Clinicians and participate in our annual Research & Quality Improvement Fair, hosted every Spring.

If there are any questions, please contact my office.

Sincerely,



Rajiv M. Modak, MD, FAAP

APPENDIX B

CONSENT DOCUMENT (DISCLOSURE AND CONSENT FORM)

Disclosure

**ENHANCING COLON CANCER SCREENING IN HOMELESS POPULATIONS:
EDUCATING PROVIDERS ON PATIENT BARRIERS**

Alma Delia Donohue

The purpose of this project is to increase provider awareness and knowledge of the barriers and challenges homeless individuals face in accessing colorectal cancer (CRC) screening and promote positive health outcomes in this population.

If you choose to take part in this project, you will be asked to complete an online pretest survey, an educational video, and a posttest survey. Completing the pre-survey will take approximately 3-5 minutes, followed by a 7-10 minute educational video, and a 3-5-minute post-survey.

There are no foreseeable risks associated with participating in this project. You will receive no immediate benefit from your participation. Your responses are anonymous. Your name will not be collected or linked to your answers.

If you choose to participate in the project, participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw from the project at any time. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

For questions, concerns, or complaints about the project, you may contact the principal investigator:

Alma Delia Donohue
DNP-FNP Candidate
915-471-9479
adonohue@arizona.edu

APPENDIX C
RECRUITMENT MATERIAL (RECRUITMENT EMAIL)

Recruitment Email

Invitation to Participate

Dear El Rio Health Center members,

My name is Alma Delia Donohue, and I am a Doctor of Nursing Practice (DNP) student at the University of Arizona. For my final DNP project, I am conducting a study to determine if education on the barriers and challenges faced by homeless patients relative to colorectal cancer (CRC) screening influences providers' understanding of this issue and willingness to conduct CRC screenings with this patient population.

If you opt to participate in this project, you will be requested to complete a pretest survey through an online platform, an educational video, and a posttest survey. Each survey will consume approximately 3-5 minutes of your time, whereas the educational video will require 7-10 minutes to complete. You are eligible to participate as you meet the following criteria:

- You are currently licensed to practice as a Primary Care Provider in the state of Arizona.
- You care for homeless patients.

Each survey is entirely confidential. Your email will not be linked to any data collected during the study, and your privacy is of utmost importance throughout the entire data collection process.

If you have any additional questions or concerns regarding this project, please contact:

Alma Delia Donohue, DNP-FNP candidate
915-471-9479
adonohue@arizona.edu

Thank you very much for your time, effort, and consideration!

Please proceed to the education and complete the pretest, educational video, and posttest by clicking on the links below:

Pretest link
Educational video link
Posttest link

APPENDIX D

EVALUATION INSTRUMENTS (DNP PROJECT PRETEST AND POSTTEST)

Donohue - DNP Project Pretest

Start of Block: Question Tour Block 1

CRC Screening For Homeless Patients

Thanks for participating in this survey.

Click the next button to get started!

Pretest Survey Questions

Demographic Survey Questions

How old are you?

- 25-39 (1)
 - 40-54 (2)
 - 55-70 (3)
 - 71 or older (4)
-

How many years have you been in practice as a Nurse Practitioner?

- < 1 year (1)
 - 1-3 years (2)
 - 4-5 years (3)
 - 5-10 years (4)
 - > 10 years (5)
-

How many years have you been working with homeless individuals?

- < 1 year (1)
- 1-3 years (2)
- 4-5 years (3)
- 5-10 years (4)
- > 10 years (5)
-

In what setting do you typically provide care for homeless individuals?

- Clinic (1)
- Mobile unit (2)
- Community center (3)
- Churches (4)
- Other (5)

Outcome Evaluation Questions Prior to the Educational Session

How much do you agree with this statement? I feel confident in my ability to identify barriers homeless patients face in accessing CRC screenings.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (6) | Somewhat agree (5) | Strongly agree (3) |
|---------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| BEFORE completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I am currently knowledgeable about the challenges homeless individuals encounter when seeking healthcare services.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (6) | Somewhat agree (3) | Strongly agree (4) |
|---------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| BEFORE completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I believe the impact of social determinants of health on the CRC screening rates among homeless populations is significant.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| BEFORE completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I am likely to initiate conversations about CRC screenings with my homeless patients.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| BEFORE completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I feel prepared to address and overcome the barriers homeless patients face in obtaining CRC screenings.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| BEFORE completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I think it is important to tailor CRC screening discussions to the unique needs of homeless individuals.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| BEFORE completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I often conduct CRC screenings for homeless patients compared to housed patients.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| BEFORE completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I am willing to conduct CRC screenings for homeless persons.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| BEFORE completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Comments Section

Please use this space to provide any feedback or comments

Please feel free to contact me for any questions or concerns:

Alma Donohue
 DNP-FNP Candidate
 adonohue@arizona.edu

Donohue - DNP Project Posttest

Start of Block: Default Question Block

CRC Screening For Homeless Patients

Thanks for participating in this survey.

Click the next button to get started!

Posttest Survey Questions

Outcome Evaluation Questions Post the Educational Session

How much do you agree with this statement? I feel confident in my ability to identify barriers homeless patients face in accessing CRC screenings.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|--------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| AFTER completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I am knowledgeable about the challenges homeless individuals encounter when seeking healthcare services.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|--------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| AFTER completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I believe the impact of social determinants of health on the CRC screening rates among homeless populations is significant.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|--------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| AFTER completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I am likely to initiate conversations about CRC screenings with my homeless patients.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|--------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| AFTER completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I feel prepared to address and overcome the barriers homeless patients face in obtaining CRC screenings.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|--------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| AFTER completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I think it is important to tailor CRC screening discussions to the unique needs of homeless individuals.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|--------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| AFTER completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I plan to conduct CRC screenings for homeless patients comparable to screening for housed patients.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|--------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| AFTER completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much do you agree with this statement? I am willing to conduct CRC screenings for homeless persons.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|--------------------------------|-----------------------|-----------------------|--------------------------------|-----------------------|-----------------------|
| AFTER completing education (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Comments section

Please use this space to provide any feedback or comments

Please feel free to contact me for any questions or concerns:

Alma Donohue
DNP-FNP Candidate
adonohue@arizona.edu

APPENDIX E
PARTICIPANT MATERIAL (ONLINE VIDEO OUTLINE)

Online Video Outline

Colorectal Cancer Screening Education

- Background information.
- The importance of CRC screening as a cancer prevention tool.
- CRC screening recommendations.
- Primary care providers' role in delivering CRC screening.

Understanding Barriers and Challenges

- Lack of patient access to healthcare.
- Lack of patient trust in healthcare providers.
- Competing priorities experienced by patients.

Guide to Healthcare for Homeless People

- Understanding the unique challenges faced by homeless individuals is essential.
- Providers can benefit from resources that address the health needs of this vulnerable population.
- Shelter-based clinics collaboration with outside primary care clinics or physician groups.
- El Rio - who can they collaborate with, and tools to move forward.

APPENDIX F
PROJECT TIMELINE

| Completion Date | Planning | Pre-implementation | Implementation | Evaluation |
|--------------------------------|--|---------------------------|---|--|
| April 1, 2024 | Obtain El Rio Health Center officer approval. | | | |
| April 29, 2024 | Finalize proposal and educational material with the committee. | | | |
| May 2, 2024 | Submit IRB application. | | | |
| May 3, 2024 | Obtain contact information for providers. | | | |
| May 6, 2024 | | Obtain IRB approval. | | |
| May 31, 2024 to June 14, 2024 | | | The participants completed the online educational intervention. | |
| June 14, 2024 to June 21, 2024 | | | | Obtain pretest and posttest data. |
| June 21, 2024 to July 12, 2024 | | | | Analyze results and distribute them to interested parties. |

APPENDIX G
LITERATURE REVIEW GRID

Project Question: *In healthcare providers who care for homeless persons, will education on the barriers and challenges faced by this patient population influence providers' understanding of this issue and willingness to conduct CRC screenings with their homeless patients?*

| Pub. Year; Author's Last Name | Title of Publication | Type of Study | Main Outcomes of Findings | Support for and or Link to Project |
|--|---|-------------------------------------|--|--|
| 2018 Asgary, R. | Cancer screening in the homeless population | Systematic review | To provide insight into barriers to screening and potential strategies to improve screening in homeless persons. | Explores cancer-related health disparities among homeless people, defines homelessness, analyzes barriers, and discusses potential interventions to improve CRC screening. |
| 2015 Baggett, T. P., Chang, Y., Porneala, B. C., Bharel, M., Singer, D. E., & Rigotti, N. A. | Disparities in cancer incidence, stage, and mortality at Boston Health Care for the Homeless Program. | Cohort study | Colon cancer incidence, stage, and mortality are higher in homeless adults relative to the general population standards. | Examines factors that contribute to low rates of CRC screening among homeless individuals. |
| 2021 Facciorusso, A., Demb, J., Mohan, B. P., Gupta, S., & Singh, S. | Addition of financial incentives to mailed outreach for promoting colorectal cancer screening: A systematic review and meta-analysis | Systematic review and meta-analysis | Completion of CRC screening within 12 of receiving the financial incentive. | Evaluates the benefit of adding financial incentives to the uptake of CRC screening. |
| 2020 Hardin, V., L. Tangka, F. K., Wood, T., Boisseau, B., Hoover, S., DeGroff, A., Boehm, J., et al. | The effectiveness and cost to improve colorectal cancer screening in a federally qualified homeless clinic in Eastern Kentucky | Quantitative study | Financial incentives and reminders can increase FIT kit return rates. | Analyzes the effectiveness and cost of patient incentives and reminders to increase FIT kit return rates. |
| 2017 Huang, J. L., Fang, Y., Liang, M., Li, S. T., Ng, S. K., Hui, Z. S., Ching, J., et al. | Approaching the hard-to-reach in organized colorectal cancer screening: an overview of individual, provider and system level coping strategies. | Systematic review | Organized CRC screening offers a system of access to approach homeless populations. | Identifies the hard-to-reach population in CRC screening and examines strategies to increase the screening rate in this population. |
| 2021 | Increasing uptake of colon cancer screening in a | Evaluation research | Identified blood-based testing as an effective | Assesses patient preference and the offering of blood- |

| Pub. Year; Author's Last Name | Title of Publication | Type of Study | Main Outcomes of Findings | Support for and or Link to Project |
|---|--|------------------------------------|---|---|
| Ioannou, S., Sutherland, K., Sussman, D. A., & Deshpande, A. R. | medically underserved population with the addition of blood-based testing | | method to increase CRC screening in underserved populations. | based tests on CRC screening rates. |
| 2009 Katz, M. L., Heaner, S., Reiter, P., van Putten, J., Murray, L., McDougle, L., Cegala, D. J., Post, D., David, P., Slater, M., & Paskett, E. D. | Development of an educational video to improve patient knowledge and communication with their healthcare providers about colorectal cancer screening | Qualitative research | Themes identified: treat appraisal, sources of information, systems level issues, and communication issues | Obtains feedback about a CRC screening video from medical professionals. |
| 2022 Krumm, I. R., Miles, M. C., Clay, A., Carlos II, W. G., & Adamson, R. | Making effective educational videos for clinical teaching | Descriptive research | Step-by-step instructions for identifying a topic, choosing software, planning a video, and recording. | Provides tips for creating educational videos. |
| 2021 Lanese, B. G., Birmingham, L., Alrubaie, N., & Hoornbeek, J. | Healthcare for the Homeless (HCH) projects and Medicaid expansion | Exploratory retrospective analysis | Medicaid expansion has a positive association with increased medical services utilization for homeless populations. | Explores the relationship between Medicaid expansion, the percentage of uninsured patients, and the change in the percentage of patient visits. |
| 2021 Mehta, S. J., Reitz, C., Niewood, T., Volpp, K. G., & Asch, D. A. | Effect of behavioral economic incentives for colorectal cancer screening in a randomized trial | Randomized trial | The financial incentive increased CRC risk assessment completion. | Examines the effect of financial incentives on participation in CRC prevention. |
| 2022 Portela Dos Santos, O., Melly, P., Hilfiker, R., Giacomino, K., Perruchoud, E., Verloo, H., & Pereira, F. | Effectiveness of educational interventions to increase skills in evidence-based practice among nurses: The EDITcare systematic review. | Systematic review | Highlights the influence that educational strategies have on the ability to master and implement EBP. | EBP improves the implementation of safe, high-quality healthcare for patients. |
| 2022 Schwartz, H. E. M., Abel, M. K., Lin, J. A., Decker, H. C., Kushel, M. B., & Wick, E. C. | Barriers to colorectal cancer screening and surveillance in homeless patients: A case report and policy recommendations | Case report | Identifies general and structural barriers to CRC screening among homeless people. | Provides policy solutions to increase primary and secondary CRC screening among homeless people, |

| Pub. Year; Author's Last Name | Title of Publication | Type of Study | Main Outcomes of Findings | Support for and or Link to Project |
|--|--|----------------------|---|---|
| 2022 Thorndike, A. L., Yetman, H. E., Thorndike, A. N., Jeffrys, M., & Rowe, M. | Unmet health needs and barriers to health care among people experiencing homelessness in San Francisco's Mission District: A qualitative study | Qualitative study | Identifies unmet needs and barriers to healthcare and recommendations for improving services. | Examines perspectives of people experiencing homelessness and healthcare providers at community-based homeless health and service organizations |

REFERENCES

- Abraham, C. & Sheeran, P. (2015). The health belief model. *Predicting and Changing Health Behavior*. McGraw-Hill.
https://www.researchgate.net/publication/290193215_The_Health_Belief_Model
- American Cancer Society. (ACS). (2024). *Colorectal cancer risk factors*. Cancer.org.
<https://www.cancer.org/cancer/types/colon-rectal-cancer/causes-risks-prevention/risk-factors.html>
- American Cancer Society. (ACS). (2024). *Key statistics for colorectal cancer*. Cancer.org.
<https://www.cancer.org/cancer/types/colon-rectal-cancer/about/key-statistics.html>
- Asgary, R. (2018). Cancer screening in the homeless population. *The Lancet Oncology*, 19(7), e344–e350. [https://doi.org/10.1016/S1470-2045\(18\)30200-6](https://doi.org/10.1016/S1470-2045(18)30200-6)
- Arizona Department of Health Services. (AZDHS). (2014). *Colorectal cancer in Arizona*.
<https://www.azdhs.gov/documents/preparedness/public-health-statistics/cancer-registry/reports/az-colorectal-cancer-07-11.pdf>
- Baggett, T. P., Chang, Y., Porneala, B. C., Bharel, M., Singer, D. E., & Rigotti, N. A. (2015). Disparities in cancer incidence, stage, and mortality at Boston Health Care for the Homeless Program. *American Journal of Preventive Medicine*, 49(5), 694–702.
<https://doi.org/10.1016/j.amepre.2015.03.038>
- City of Tucson. (2023). *2023 Point in time homeless count results*. Tucsonaz.gov.
<https://www.tucsonaz.gov/Departments/Housing-and-Community-Development/HCD-News/2023-Point-in-Time-Homeless-Count-Results>
- ColonoscopyAssist. (n.d.). *Tucson, AZ colonoscopy*.
<https://colonoscopyassist.com/facilitylocations-rates/locations-by-city/colonoscopy/tucson-az-colonoscopy/>
- Dlugasch, L., & Story, L. (2021). Gastrointestinal function. *Applied pathophysiology for the advanced practice nurse*. Jones & Bartlett Learning.
- El Rio. (2022). *2022 Mid-year community report 2021 annual report*. <https://elrio.org/wp-content/uploads/2022/08/mid-year-report-2022-final.pdf>
- Etchells, E., & Woodcock, T. (2018). Value of small sample sizes in rapid-cycle quality improvement projects 2: assessing fidelity of implementation for improvement interventions. *BMJ Quality & Safety*, 27(1), 61–65. <https://doi.org/10.1136/bmjqs-2017-006963>

- Facciorusso, A., Demb, J., Mohan, B. P., Gupta, S., & Singh, S. (2021). Addition of financial incentives to mailed outreach for promoting colorectal cancer screening: A systematic review and meta-analysis. *JAMA Network Open*, 4(8), e2122581. <https://doi.org/10.1001/jamanetworkopen.2021.22581>
- Hardin, V., L. Tangka, F. K., Wood, T., Boisseau, B., Hoover, S., DeGroff, A., Boehm, J., & Subramanian, S. (2020). The effectiveness and cost to improve colorectal cancer screening in a federally qualified homeless clinic in Eastern Kentucky. *Health Promotion Practice*, 21(6), 905. <https://doi.org/10.1177/1524839920954165>
- HealthIT.gov. (2022). *Advantages of electronic health records*. <https://www.healthit.gov/faq/what-are-advantages-electronic-health-records>
- Huang, J. L., Fang, Y., Liang, M., Li, S. T., Ng, S. K., Hui, Z. S., Ching, J., et al. (2017). Approaching the hard-to-reach in organized colorectal cancer screening: an overview of individual, provider and system level coping strategies. *AIMS Public Health*, 4(3), 289–300. <https://doi.org/10.3934/publichealth.2017.3.289>
- IHI. (n.d.). *How to improve: model for improvement*. <https://www.ihl.org/resources/how-to-improve>
- Ioannou, S., Sutherland, K., Sussman, D. A., & Deshpande, A. R. (2021). Increasing uptake of colon cancer screening in a medically underserved population with the addition of blood-based testing. *BioMed Central Cancer*, 21, 966. <https://doi.org/10.1186/s12885-021-08678-8>
- Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2015). The Health Belief Model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. *Health Communication*, 30(6), 566–576. <https://doi.org/10.1080/10410236.2013.873363>
- Katz, M. L., Heaner, S., Reiter, P., van Putten, J., Murray, L., McDougale, L., Cegala, D. J., Post, D., David, P., Slater, M., & Paskett, E. D. (2009). Development of an educational video to improve patient knowledge and communication with their healthcare providers about colorectal cancer screening. *American Journal of Health Education*, 40(4), 220–228. <https://pubmed.ncbi.nlm.nih.gov/20209024/>
- Koehler, K. (2021). Medical mistrust among individuals experiencing homelessness. *Temple University Libraries*. <http://dx.doi.org/10.34944/dspace/6474>
- Krumm, I. R., Miles, M. C., Clay, A., Carlos II, W. G., & Adamson, R. (2022). Making effective educational videos for clinical teaching. *Chest*, 161(3), 764–772. <https://doi.org/10.1016/j.chest.2021.09.015>

- LaMorte, W. W. (2022). *The health belief model*. Boston University School of Public Health. <https://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories2.html>
- Lanese, B. G., Birmingham, L., Alrubaie, N., and Hoornbeek, J. (2021). Healthcare for the homeless (HCH) projects and Medicaid expansion. *J Community Health, 46*, 1139–1147. <https://doi-org.ezproxy4.library.arizona.edu/10.1007/s10900-021-01000-4>
- Lau, J., Lim, T. Z., Jianlin Wong, G., & Tan, K. K. (2020). The health belief model and colorectal cancer screening in the general population: A systematic review. *Preventive Medicine Reports, 20*, 101223. <https://doi.org/10.1016/j.pmedr.2020.101223>
- Little, T. D., Chang, R., Gorrall, B. K., Waggenspack, L., Fukuda, E., Allen, P. J., & Noam, G.G. (2020). The retrospective pretest–posttest design redux: On its validity as an alternative to traditional pretest–posttest measurement. *International Journal of Behavioral Development, 44*(2), 175–183. <https://doi.org/10.1177/0165025419877973>
- Mehta, S. J., Reitz, C., Niewood, T., Volpp, K. G., & Asch, D. A. (2021). Effect of behavioral economic incentives for colorectal cancer screening in a randomized trial. *Clinical Gastroenterology and Hepatology: The Official Clinical Practice Journal of the American Gastroenterological Association, 19*(8), 1635–1641.e1. <https://doi.org/10.1016/j.cgh.2020.06.047>
- National Cancer Institute. (NCI). (2023). *Colorectal cancer screening*. https://progressreport.cancer.gov/detection/colorectal_cancer
- Portela Dos Santos, O., Melly, P., Hilfiker, R., Giacomino, K., Perruchoud, E., Verloo, H., & Pereira, F. (2022). Effectiveness of educational interventions to increase skills in evidence-based practice among nurses: The EDITcare systematic review. *Healthcare (Basel, Switzerland), 10*(11), 2204. <https://doi.org/10.3390/healthcare10112204>
- Rosenstock, I. M. (1974). The health belief model and preventive health behavior. *Health Education Monographs, 2*(4), 354–386. <https://doi.org/10.1177/109019817400200405>
- Schwartz, H. E. M., Abel, M. K., Lin, J. A., Decker, H. C., Kushel, M. B., & Wick, E. C. (2022). Barriers to colorectal cancer screening and surveillance in homeless patients: A case report and policy recommendations. *Annals of Surgery Open: Perspectives of Surgical History, Education, and Clinical Approaches, 3*(3), e183. <https://doi.org/10.1097/AS9.000000000000183>
- Solaris Community Capital. (n.d.). *El Rio Cherrybell Health Clinic*. <https://www.solariscommunitycapital.com/el-rio-cherrybell-health-clinic>

Sullivan, G. M., & Artino, A. R., Jr (2013). Analyzing and interpreting data from Likert-type scales. *Journal of Graduate Medical Education*, 5(4), 541–542.

<https://doi.org/10.4300/JGME-5-4-18>

The HS Lopez Family Foundation. (n.d.). *Partnering organizations*.

<https://centerofopportunity.org/partnering-organizations/>

Thorndike, A. L., Yetman, H. E., Thorndike, A. N., Jeffrys, M., & Rowe, M. (2022). Unmet health needs and barriers to health care among people experiencing homelessness in San Francisco’s Mission District: A qualitative study. *BMC Public Health*, 22(1071).

<https://doi.org/10.1186/s12889-022-13499-w>

U.S. Department of Health and Human Services (HHS). (2022). *The Belmont Report*.

<https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/index.html>

USPSTF. (2021). Screening for colorectal cancer. US Preventive Task Force recommendation statement. *Journal of the American Medical Association*, 325(19), 1965-1977.

<https://doi:10.1001/jama.2021.6238>