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Barriers to Colorectal Cancer Screening in People Obtaining Care From Community Mental Health Agencies

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This is to certify that the doctoral dissertation by

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Abstract

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MSN, Wayne State University, 1997

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Despite being highly treatable with early intervention and preventative screenings, the overall mortality rate of colorectal cancer is substantially higher in participants with a preexisting mental disorder. Variables affecting the likelihood of completing screening for those with mental illnesses were unknown in people who obtain services from a Community Mental Health agency. Using the Health Belief Model, the proposed study investigated the effects of access to transportation, referral to screening, physical ability to complete the colonoscopy prep, type of procedure, awareness of the purpose of screening, anxiety, embarrassment, gender, race, and age to determine which affect completion of colorectal cancer screening. Significant relationships existed between embarrassment, fear of pain, fear of cancer, anxiety, physical ability to do testing, awareness of screening at age 50, FOBT vs Scope procedures, age of first screening, being told to get screening, knowing someone who had screening, and completion of colorectal cancer screening. In the binary logistic model Anxiety was negatively correlated and being told to get screening was positively correlated to completion of colorectal cancer screening and those choosing Scope were more likely to complete than those choosing FOBT. The results of this study may effect positive social change by providing healthcare providers with an increased understanding of variables that influence colorectal cancer screening completion among persons with a diagnosed mental illness, resulting in a changing agenda for effective mental and physical health care in this population.

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Dedication

This is dedicated to my husband, Greg Pierson, and to my stepson, Bill Pierson, who understood time that I spent writing papers and who provided a great deal of support, laughter, and happiness. To my four-legged family members who cuddled with me while I studied. To my mother, Danez Gardiner (Stan Roth and Vern Glasscock) and Barbara Pierson for their support and kindness, during the dissertation process and always. To my dear friend and "dad" Thomas Pierson, who looked forward to coming to my graduation ceremony (7/19/1933-7/25/2015) and who will be there in spirit along with my father, Dr. John Gardiner (7/8/1933-6/20/2015), who was happy to have another doctor in the family.

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Many thanks to Dr. Peter Anderson, who helped me with the dissertation process and who gave wonderful feedback and support with the process. Thank you also to Dr. T. Carey, MD whose knowledge beyond medicine helped me to regain confidence in myself and in my career. Thank you to Dr. Carey for allowing me to use her agency to help further the body of research in regard of disparities in medical care for our consumers of mental health services.

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Chapter 1: Introduction to the Study

Introduction

Colorectal cancer is the third most common type of cancer, with an estimated 93,090 new cases of colon cancer and 39,610 new cases of rectal cancer diagnosed in the United States in 2015 (American Cancer Society, 2015). Colorectal cancer is the second leading cause of cancer death behind lung cancer (Centers for Disease Control, 2011) About 1 in 20 people have a lifetime risk of being diagnosed with colorectal cancer, causing an estimated 49,700 deaths in 2015 (American Cancer Society, 2015). However, due to screening and early detection, the rate of death from colorectal cancer has been dropping steadily for both men and women over the past 20 years (American Cancer Society, 2015). Despite this high incidence, the American Cancer Society (2011) estimated that only 52.3% of adults over the age of 50 have been screened for colorectal cancer. The Centers for Disease Control (2011) indicated that 1 in 3 adults between the ages of 50 and 75 were not up-to-date with recommended colorectal cancer screening. The US Preventive Services Task Force (2016) indicates that the median age at death from colorectal cancer is 68 years.

One population that does not demonstrate similar success in reduced mortality rates from cancer are those with mental illness. According to the U.S. Department of Health's (2013) National Survey on Drug Use and Health, 18.6% of all adults in the United States are diagnosed with mental illness under the following qualifications:

a) diagnosed with a mental, behavioral, or emotional disorder (excluding developmental and substance use disorders);

b) diagnosable currently or within the past year; and

c) of sufficient duration to meet DSM-IV diagnostic criteria.

An estimated 43.7 million adults in the United States have a diagnosed mental illness (U.S. Department of Health, 2013). In Michigan's Community Mental Health (CMH) Services Programs, 78.95% of the 198,695 individuals with mental illnesses who received care lived in private residences, whereas 7.48% lived in institutions or supervised living situations, 4.38% are homeless, 1.33% lived with foster families, 1.32% were incarcerated, and 7.14% had unreported living situations (Michigan Department of Community Health, 2013). Regarding preventive care, Xiong, Bermudes, Torres, and Hales (2008) determined that in a sample of 229 outpatients with mental illnesses, more than 50% over the age of 50 had never received colorectal cancer screening, and 12% had completed a fecal occult blood stool test (FOBT) in the past year or a flexible sigmoidoscopy or colonoscopy in the past five years. Besides Xiong et al.'s (2008) study, however, research on colorectal cancer screening rates among those with mental illnesses is limited.

The limited extant research suggests a disparity in medical care for those with mental illnesses. Lawrence et al. (2013), Musuuza et al. (2013), and Viron and Stern (2010) determined that those with mental illness experienced different medical care than other patients. According to Happell, Brenda et al (2012), people with mental illness were 20-30% less likely to receive breast, cervical and colorectal cancer screening than those without a mental illness.

Baillargeon et al. (2011) examined 80,670 people over 65 years of age, for a

period of 12 years, and determined that those with mental disorders were more likely to be diagnosed with colon cancer only at autopsy, and with an unknown stage of cancer. This population is also more likely to have not received any treatment for colon cancer at death, thereby increasing colon cancer specific mortality (Baillargeon et al., 2011). Because screening drastically reduces mortality rates for patients with colorectal cancer, this study was designed to identify variables that predict colorectal cancer screening completion among those with mental illnesses. This chapter will provide background on the issue, statement of the study problem and purpose, research questions and hypotheses, and the parameters and significance of the study.

Background

At the time of this dissertation study, the U.S. healthcare system was very fragmented, resulting in unmet treatment needs and increased poor health among patients with mental disorders (Croft & Parish, 2012). Though colorectal cancer can be prevented through screenings (Canadian Task Force on Preventive Health Care, 2001), the complexity of the screening itself can be overwhelming for the average person and even more so for people with a serious and persistent mental illness (Viron & Stern, 2010; Musuuza et al., 2013).There is a significant body of literature about disparities in medical well-being and loss of lifespan stemming from persons having a serious and persistent mental illness (Lawrence, et al., 2013; Musuuza, et al., 2013; Viron & Stern, 2010). Previous research, exemplifiedthroughout this paper, has highlighted the need for mental health and medical providers to pay attention to the medical needs of people with chronic and persistent mental illness.

Several solutions have been proposed for the problems of fragmented healthcare and its impact on those with mental illness. Some of these include recommendations for more involvement from Psychiatric Nurses (Scott & Happell, 2011) and adopting integrated health care systems that combine medical care within CMH agencies (Colton & Manderscheid, 2006). Other suggestions include putting a medical provider in the same building as mental health services or using Case Managers (who are usually Bachelor-prepared human services workers) to help coordinate medical care. Peer Advocates, who are former or current patients at the CMH agency, have also been used to assist individuals with obtaining and complying with recommended medical care. This help is needed due to cognitive impairments that often accompany a serious mental illness (Lawrence & Kisely, 2010). Although previous research has examined solutions to the problem, at the time of this dissertation study, no studies had identified predictive variables for colorectal cancer screening among the mentally ill who get services from a CMH.

There are various types of screenings that include a fecal occult blood test (FOBT/FIT) that usually requires the individual to give three different samples of feces to the medical provider. Sometimes kits are provided so that the person can put a sample on a slide three different times and then mail it in to a laboratory. According to the American College of Gastroenterology (2008) the following recommendations are:

Colonoscopy every 10 years is the preferred colorectal cancer prevention test

Annual fecal immunochemical testing is the preferred colorectal cancer detection test.

African Americans should begin colorectal screening with colonoscopy at age 45. More extensive guidelines explain when follow up screening is needed depending upon results and recognition of needs of different population groups. The United States Preventive Services Task Force (USPSTF; 2008) does not specify which test is preferred and provides evidence based pros and cons of screening methods. If the FOBT/FIT shows blood, a scope is recommended. It is recommended that the FOBT be done every year from age 50-75 for a person at average risk. A flexible sigmoidoscopy, a procedure in which a tube is inserted into the rectum to check for cancer up to the level of the colon, is recommended every five years, with the FOBT/FIT being done every three years. A colonoscopy looks at the entire colon and it is recommended that this be done every 10 years. These guidelines are routinely updated as more research evolves.

There are other tests such as a Barium Enema or swallowing a camera pill however, these test and others will not be addressed in this study. The questionnaire was designed to assess whether or not a FOBT/FIT or a scope procedure was done as patients may not be able to tell the name of the procedure (sigmoidoscopy or colonoscopy) but the preparation is difficult and the same for both of the scope procedures. The recommended number of times a person had these procedures done will also be investigated. For example, if someone had a FOBT/FIT once at age 50 and reaches age 65 without any other screening procedures, this indicates a lack of appropriate screening. Note that the FOBT may be confused with the FIT which is a different type of study of the fecal samples however, the term FOBT was used as participants may not know the difference between the types of samples tests done.

This study examined potential barriers to colorectal cancer screening, in hopes that identified barriers to colorectal cancer screening for those with mental illness, might apply to other preventive screenings. Once barriers to preventive healthcare are identified, this information can be used as part of a comprehensive Health Integration Model of care at a CMH agency or at a primary medical provider's practice. Overall, the goal of this research was to determine which variables help to predict whether or not people with mental illness, who obtained care from a CMH agency, will complete colorectal cancer screening.

Problem Statement

It has been estimated that 46.4% of Americans will experience mental illness and those with chronic mental illness will live 15-20 fewer years than people without mental illness (Kessler et al., 2005; Wahlbeck, Westmann, Nordentoft, & Gissler, 2011). Approximately 80% of these deaths are due to medical conditions, as opposed to suicide (Lawrence, Hancock, & Kisley, 2013). In addition to a shorter life span, the incidence of cancer in people with mental illness is 2.5 times greater than that of the general public and, in men younger than 50 years, 6.6 times the risk than that of the general public (Pandiani, Boyd, Bank, & Johnson, 2006, p. 1). Individuals with mental illness, who died of cancer, passed away at an average of 10 years earlier than individuals without mental illness (Musuuzo et al., 2013)

The overall mortality rate (hazard ratio [HR]=1.33, 95% CI=1.31-1.36) and colon cancer-specific mortality rate (HR=1.23, 95% CI=1.19-1.27) is substantially higher in participants with a preexisting mental disorder (Baillargeon et al., 2011). Colorectal

cancer is highly treatable so long as screening measures and early intervention is available, supporting Viron and Stern's (2010) assertion that people with mental illness are losing years of life to preventable, treatable diseases. At the time of this study, no prior research had determined variables that predict colorectal cancer screening among mentally ill populations.

Purpose of the Study

The purpose of the proposed quantitative correlational survey design study was to identify variables that affect the probability of completion of colorectal cancer screening, whether through FOBT (stool sample), or sigmoid/colonoscopy (scope) by mentally ill subjects who obtain mental health care from a CMH agency. The data analysis includes correlation analyses of the variables and logistic regression. The dependent variable is dichotomous, for example: Was colorectal cancer screening completed? The independent variables may be any level of measurement. The independent variables considered were age, type of mental illness, race, access to transportation, being told to get colorectal cancer screening, understanding the colonoscopy preparation, understanding why colorectal cancer screening is needed, fear of pain, and embarrassment.

Research Questions and Hypotheses

Research Question 1: What is the relationship between embarrassment, fear of pain, fear of cancer, anxiety and completion of colorectal cancer screening?

- H_01: There is no relationship between embarrassment, fear of pain, fear of cancer, anxiety and completion of colorectal cancer screening.

- H_A1: There is a relationship between embarrassment, fear of pain, fear of cancer,

anxiety and completion of colorectal cancer screening.

Research Question 2: What is the relationship between transportation, physical ability to do testing, understanding the preparation for testing and completion of colorectal cancer screening?

- $H_0 2$: There is no relationship between transportation, physical ability to do testing, understanding the preparation for testing and completion of colorectal cancer screening?

- $H_A 2$: There is a relationship between transportation, physical ability to do testing, understanding the preparation for testing and completion of colorectal cancer screening?

Research Question 3: What is the relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

- $H_0 3$: There is no relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

- $H_A 3$: There is a relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

Research Question 4: What is the relationship between being physically able to complete the colonoscopy *scope* prep and completion of the test?

- $H_0 4$: There is no relationship between being physically able to complete the colonoscopy *scope* prep and completing the test.

- $H_A 4$: There is a relationship between being physically able to complete the colonoscopy *scope* prep and completing the test.

Research Question 5: What is the relationship between FOBT vs Scope procedures, age of first screening, and a diagnosis of colorectal cancer?

- $H_0 5$: There is no relationship between FOBT vs Scope procedures, age of first screening, and a diagnosis of colorectal cancer.

- $H_A 5$: There is a relationship between, FOBT vs Scope procedures, age of first screening, and a diagnosis of colorectal cancer.

Research Question 6: What is the relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer, and completion of colorectal cancer screening?

- $H_0 6$: There is no relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer and completion of colorectal cancer screening.

- $H_A 6$: There is a relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer and completion of colorectal cancer screening

Theoretical Framework

The health belief model (HBM) was the theoretical framework for the study. Hochbaum, Rosenstock, and Kegels (1950) formulated the HBM in 1950 to explain health behavior. During the 1950s, when tuberculosis (TB) was a public health threat and free testing became available, four constructs of the model emerged, involving a person's perceptions of susceptibility, severity, barriers, and benefits. Glanz, Lewis, and Remer

(1997) extended the concepts of perceived susceptibility, severity, and barriers, stating that:

- perceived susceptibility involves perceptions of risk for a disease;

- perceived severity is the extent of understanding of the seriousness and consequences of a disease; and

- perceived barriers include the person's reasons for not receiving colorectal cancer screening.

Hochbaum et al. (1950) indicated that the construct of perceived benefits is the value that a person places on changing health behaviors to reduce risks of getting colorectal cancer.

The HBM states that the belief in a personal threat, together with the belief in the effectiveness of the proposed behavior, predicts the likelihood of patients' behaviors (Rosenstock et al., 1988). This framework was designed to predict human behavior where preventive health is concerned. The hypothesis correlates with the survey questions and the constructs of this framework Questions are also included that assess clients who had or have colorectal cancer and variables related to getting a diagnosis, such as "Was the screening that caught the cancer, done later than the recommended age 50?" and "Was the cancer diagnosed due to symptoms prompting screening?" By applying this framework to colorectal cancer screening, I sought to identify predictive variables that increase colorectal cancer screening completion.

Nature of the Study

This quantitative study was designed to identify which variables affect colorectal cancer screening completion. A convenience sample of CMH clients was gathered in

order to respond to a questionnaire; I only recruited participants who had insurance, so as to avoid variables affecting the uninsured. The state where this research took place incorporated expanded Medicaid over 6 months ago; therefore, most of the clients had Medicaid for at least six months, which again avoids outliers from the uninsured. Power analysis determined the sample size. People ages 50-75 were included in the survey, in alignment with the United States Preventive Services Task Force's (2008) recommendation for colorectal cancer screening for people age 50-75 years or sooner, depending upon family history. Permission to survey clients at two different offices from the same agency was obtained, and a private place was used for completion of the survey. The researcher completed certification for human subject research through the Health Resources and Services Administration (HRSA, 2016). Strict adherence to Walden University's Research Ethics and Institutional Review Board (Walden, 2010) took place.

The purpose of this quantitative study was to identify variables that affect the probability of completion of colorectal cancer screening by mentally ill subjects who obtain mental health care from a CMH agency. The data analysis included correlation analyses of the variables and logistic regression. The dependent variable wass dichotomous and.the independent variables were age, race, access to transportation, being told to get colorectal cancer screening, understanding the colonoscopy preparation, understanding why colorectal cancer screening is needed, and embarrassment.

This quantitative study was comprised of several analyses. The correlation analysis d included correlations of all variables, with statistical significance reported, and included partial and semipartial correlations. The logistic regression produced a

predictive model that shows how the independent variables affect the probability of the

dependent variable outcome, which was whether colorectal cancer screening completed.

Interactions can be tested for, in the regression, by the coding of the variables. The

logistic regression analysis produced a best fitting model with the most relevant and

statistically significant predictors.

Definitions

Colonoscopy: An outpatient procedure in which the inside of the large intestine

(colon and rectum) is examined by inserting a camera into the intestine in order to look

for causes of problems (blood in the feces or abnormal bowel movements) or to check for

potential problems such as polyps (a growth of tissue which could turn to cancer) or

cancer itself. During the procedure, polyps are removed and checked for cancer. A person

preparing for a colonoscopy has to drink clear liquids for a day, not eat any food, and

take medication that causes diarrhea in order to empty the bowel (Cleveland Clinic,

2010). This study did not differentiate between a sigmoidoscopy and colonoscopy

because most patients do not know the difference.

Community Mental Health Department (CMH): In order to obtain services from a

CMH a person must be a resident of a designated county, diagnosed with a primary

mental illness that is severe and persistent, with or without a substance abuse problem

that causes functional impairment (Detroit Central City, 2015). Some CMHs take in

people that have a mental illness that may not be considered severe while others service

people with developmental disabilities with or without a mental illness. Referrals are

often made after a psychiatric hospitalization, discharge from prison, by family members,

courts, and medical providers. Services may include diagnosis and treatment of the mental/substance abuse illness through medication and therapy as well as assistance with obtaining insurance, disability, jobs, housing, food, medication compliance, and activities of daily living.

Fecal Occult Blood Test/Fecal Immunoassay Test: A test that requires that a person provide three different fecal samples by putting them on a slide and mailing them or returning them to the prescriber. A kit is provided with directions and equipment needed. These tests look for blood which may be indicative of colorectal cancer (https://labtestsonline.org/understanding/analytes/fecal-occult-blood/tab/test).

Dependent Variable

Completed colorectal cancer screening. A dichotomous variable (yes/no) corresponding to having completed colorectal cancer screening by colonoscopy.

Independent Variables

Access to transportation: A dichotomous variable (yes/no) corresponding to individual's ability to have someone willing to drive them to the facility, stay with the person during the cancer screen, and take them home.

Being told to get colorectal cancer screening: A dichotomous variable (yes/no) corresponding to individual being advised to receive CRC screening.

Being physically able to do the preparation: A dichotomous variable (yes/no) corresponding to individual's ability to complete the prep which in involves clear liquids and diarrhea.

Understanding why colorectal cancer screening is needed: A dichotomous variable (yes/no) corresponding to individual understanding why the colorectal cancer screening is necessary.

Embarrassment/Anxiety/Fear: A dichotomous variable (yes/no) corresponding to individual experiencing feelings of embarrassment over the colonoscopy procedure.

Race: A categorical (nominal) variable corresponding to an individual's ethnicity or race was measured in the demographic portion of the survey.

Age: A continuous variable corresponding to an individual's age was measured in the demographic portion of the survey. The age range is 50-75 years.

Assumptions

In order to conduct this study, some assumptions were required. Some of the routine assumptions regarding participants were that they will answer, to the best of their knowledge, the questions on the questionnaire, and that participation is voluntary. This assumption was required in order to enable a reliance on the data; furthermore, anonymity improves the likelihood that participants will participate as honestly as they are able (Ong & Weiss, 2000). Participants names or other identifying data was not collected.

In addition, it was assumed that the sample size was sufficient to represent the population under study. To assess the minimum required size, Tabachnick and Fidell (2012) used a formula to determine that sampling 114 participants was needed in order to justify empirical validity. I also assumed that the participants understood the questions being asked because of the clearly worded description and photographs explaining what a

colonoscopy is. To assist this assumption, the wording developed for the questionnaire was elementary grade-level (i.e., "poop" was put in parentheses after the medical term "feces" in case someone was not aware what feces meant). Thus, it can be assumed that those participating in the study understood the questionnaire. A pilot study using experts in the field of psychiatry validated the procedures and instruments used, assisting with the assumption that the final results would be valid.

<div align="center">**Scope and Delimitations**</div>

Some gastrointestinal organizations recommend colorectal cancer screening at age 45 for people of African descent; however, to keep the research simplified, the U.S. Preventive Services Task Force (2008) recommendations were followed which is age 50-75 years. It is of note that if there is a family history of colorectal cancer, screenings might take place sooner, yet this recommendation will not be investigated in this study to simplify the research which is focusing on barriers to colorectal cancer completion among mentally ill populations. The sample will be from 114 or more individuals ages 50 and over, who receive treatment at an east- and at a west-side CMH office in Detroit, Michigan. In the population under study, the majority of people in this sample were evenly distributed into male and female groups, were living with relatives or someone else in a private household, had a total household income of less than 10,000 dollars, were unemployed, and had Medicaid and/or Medicare (MDCH, 2013).

Due to the lack of information about comorbidity and the multiple conditions that may be implicated, comorbidity was not considered in the proposed study. In addition, some patients with mental illnesses may have a lack of awareness about their present

medical conditions (Lawrence et al., 2013; Musuuza et al., 2013; Viron & Stern, 2010).

Therefore, the anonymous survey design was chosen to elicit honest, open responses also

precluding the inclusion of reliable data related to comorbid conditions in this population.

The ability to understand sigmoidoscopy versus colonoscopy and fecal occult

blood test versus fecal immunochemical testing, was not specified because such would be

too complex to determine. Therefore, the colonoscopy prep was explained and the

individual was asked whether or not he or she would be able to complete such a

procedure. It might be that some people have difficulty walking, which might result in the

inability to get to the toilet with drug induced diarrhea. Or, withholding food in someone

with diabetes might be a problem resulting in low blood sugar. The proposed study did

not examine specific reasons, but rather a broader assessment of whether people think

they could physically complete the preparation. These specific factors should be

addressed in detail by a health provider when recommending colorectal cancer screening.

This study focused on the colonoscopy exam. Some gastrointestinal

organizations recommend one of two types Fecal Occult Blood Test (FOBT), a guaiac

blood detection test or a fecal immunochemical test (FIT), both of which involve putting

a sample of feces from a few bowel movements onto a slide and sending them to a

laboratory (Centers for Disease Control and Prevention, 2009). However, these tests do

not check for the polyps that can turn to cancer. In a study by Quentero et al. (2012) a

comparison was made of FIT and colonoscopy completion and it found that FITs were

more likely to be completed than a colonoscopy and detection of cancer was comparable;

therefore, some researchers suggested that using a less complicated screening procedure,

like the FIT, could increase screening compliance; However, late stage adenomas (cancer) were found more in the colonoscopy group (Quentero et al., 2012). For simplicity, only the colonoscopy (which could be a sigmoidoscopy) and the FOBT (which could be the FIT) was assessed. It is not likely that a patient would understand or know the difference between the two tests or which one was ordered when the preparation is the same.

For this study, the Health Belief Model was used to interpret results. Several other theories have been applicable to this study, for example the Theoretical Stages of Change Model. However, that would focus on what stage the person was in, in regard to participation in CRC screening. For example, would the person be in the pre-contemplation phase where he or she knows about the importance of CRC screening but wasn't ready to think about it, or, the action stage where the person was ready to get the testing done. One of the reasons that this model wasn't chosen is that it evaluates the knowledge that a person has (the importance of CRC screening) and what stage the person is in where completion of CRC occurs.

In order to determine variables that affect CRC screening, the importance of the need for CRC screening needs to be evaluated as opposed to assuming everyone sampled is aware of this information. This is where the HBM is utilized.

Limitations

One limitation of the present study was that patients were not asked to identify their specific mental health diagnosis. Most people do not know their correct diagnosis due to different diagnoses and changing conceptions of disorders; therefore, that factor

was not asked of participants (Aboraya, Rankin, France, El-Missionary, & John, 2006).

Even if a patient had an initial visit with a psychiatrist, the person is usually given a

tentative diagnosis depending upon how good of a historian the person was, his or her

age, substance use, and other factors which may change over time. For that reason, the

general category of mental illness was used to avoid relying on self-reporting of the

diagnosis.

The questionnaire, study materials, and expected independent variables resulted

from the use of the HBM as a theoretical framework. The use of this theory might have

resulted in some bias in the data skewing towards support of the HBM. Logistic

regressions were limited by the researchers' ability to identify independent variables not

explained by the HBM, including race and age (Bewick, Check, & Bal, 2005).

Another limitation of this study might be the use of a convenience sample at two

locations. Both locations are in an inner city, crime and poverty stricken area as opposed

to a CMH Department located in a low crime or higher income area. Due to the

convenience sampling procedure, geographical restrictions may exist which may restrict

the generalizability of the results. Moreover, factors such as low income or crime rates

were highly represented more within this population.

Significance

The original contribution of this research was determining variables that might

influence colorectal cancer screening in people with persistent and severe mental illness

who received services from a CMH agency. Currently, there is a lack of research related

to colorectal cancer screening prevention in people with serious and persistent mental

illness. As part of the Cochrane Collaboration, a study was conducted to determine the effectiveness of interventions targeted at adults with serious mental illness and/or health care providers working with this population, in order to find out what interventions were taking place that increases cancer screening. There were no randomized controlled trials providing evidence as to which method to use in order to increase cancer screening in people with severe and persistent mental illness (Barley, Borschmann, Alter, & Tylee, 2013). In a study of 16,087 people without mental illness, more people completed the sample method as opposed to the scope however, the scope method found more cancer (American Family Physician, 2013). Therefore, this research could add to the body of knowledge for this population on this topic. It might also increase awareness of a need for preventive health care as part of a comprehensive model of patient care for people receiving treatment form a CMH agency. Use of the Psychiatric Registered Nurse might also play a role in regard to patient education and preventive recommendations.

The results of this study may also encourage innovative medical care systems to encourage colorectal screening procedures, such as Integrated Health Care and Person Centered Plans which address preventive healthcare. Integrated Health Care is in its infancy; it lacks evidence-based research as to the effectiveness of various models of integration. By better understanding the variables that might prevent completion of colorectal cancer screening, Integrated Health Care models can incorporate changes as recommended and identified through this research. The proposed study will potentially identify an agenda whereby healthcare workers could best focus their attention and increase screening compliance among mentally ill populations.

An example of using the Person Centered Plan to increase colorectal cancer screening would be to include preventive health care screenings as one of the medical goals for someone aged 50-75. The medical goal could be worded as, "I will call my insurance company to arrange transportation to see my medical provider" or "If my doctor schedules colorectal cancer screening by colonoscopy, I will call my brother to take me" or "I will ask my medical provider if I need crc screening." On a broader scale, the agency can inform and teach patients how to use Medicaid's transportation services or other resources for medical visits in order to request a colorectal screening. However, a loved one or family member would need to provide transportation for the colonoscopy itself and remain with the person for the duration of the test and recovery. Helping the person process who could accompany him or her would be of great benefit. One of the variables examined in this research was whether clients need help in understanding the complex preparation for colonoscopy cancer screening. If clients required additional explanation, a Psychiatric Registered Nurse could be integrated into the Person Centered Plan in order to make sure that the person understands how to do the preparation. A Peer Advocate might be the only person available to take the person to and from the colonoscopy procedure. Providing patients with the FOBT kit with information on how to use and checking in with the client to make sure the test is completed is another example of how this information might help increase compliance with any cancer screening.

The Psychiatric Registered Nurse could also play a role in the overall development of the medical portion of every person's plan, by identifying the need for colorectal cancer screening and informing the client. This means that it is important for a

yearly nursing assessment, which includes who needs preventive healthcare education and recommendations for screenings. Embarrassment and anxiety might be an additional consideration that the Psychiatric Registered Nurse could attempt to reduce embarrassment, and quell anxiety, with the patient while discussing reasons for the test. This research was also designed consider race and gender as possible variables of colorectal cancer screening completion. An alert to disparities in colorectal cancer completion depending upon gender and/or race, is rationale for closer attention to specific sub-populations, which might be at higher risk. For example, gender or race specific media could be incorporated into CMH programs for colorectal cancer screening awareness.

Disparities in medical care for people with mental illness are well documented; however, there needs to be more research on barriers to colorectal cancer screening completion in people with serious and persistent mental illness, specifically those who receive services from a CMH agency. By better understanding these barriers, Health Integration Models of care can incorporate ways to improve completion of preventive care. More importantly, because colorectal cancer screening requires transportation and an elaborate preparation, identified barriers might also apply to other preventive tests such as mammograms, cervical cancer screening, skin cancer, and so forth. This research may highlight the need for preventive care to be part of Health Integration Models of care and the Person Centered Plan where medical needs are concerned.

Findings of this study could also impart knowledge to mental health providers and medical providers whether or not barriers exist in completing colorectal cancer screening

and if present, ways to remedy them. Obviously, this is just one study on this population group however; it could add to the body of knowledge on this topic and hopefully promote further studies. Positive social change could occur when people understand barriers to completion of preventive screenings and use that information for Health Integrated programs, which are the wave of the future for CMH agencies, due to being mandated by insurance carriers and governmental agencies. Medical providers working in Patient Centered Medical Homes could benefit from recognition of variables, which may prevent colorectal cancer screening from taking place in people with mental illness. For CMH agencies in particular, this information could help to form a model of care where completion of preventive health care is considered a mandatory part of a Person Centered Plan. All CMH patients have a Person Centered Plan that addresses personal and health related goals. The Case Manager who develops the treatment plan with the client, could include ways to prevent barriers to cancer screening, specifically colorectal cancer screening due to the complexity of the preparation for the test. Full use of the Psychiatric Registered Nurse could occur should it turn out that the nursing assessments do not address preventive health care through recommendations and patient education.

Summary

Colorectal cancer is the third most common cancer, representing a significant portion of new cancer diagnoses per year (American Cancer Society, 2015). While colorectal cancer is relatively treatable so long as it is detected in its early stages, those with mental illnesses may be less likely to receive screenings and diagnoses, and more likely to die from colorectal cancer (Baillargeon et al., 2011). The purpose of this

quantitative study is to identify variables that affect the probability of completion of colorectal cancer screening by mentally ill subjects who obtain mental health care from a CMH agency. Chapter 1 provides an introduction to the proposed study, including an overview of background, methodology, and the significance of the study. Chapter 2 provides a more thorough investigation of the literature related to the topic, to highlight the gap in literature and demonstrate the necessity, of the proposed study. Chapter 3 outlines the research methodology and data collection and Chapter 5 details results along with implications for social and clinical change.

Chapter 2: Literature Review

Introduction

There is a preponderance of literature about disparities in medical wellbeing and loss of lifespan for patients with mental illnesses, highlighting the need for additional attention from mental health and medical care providers for people with mental illnesses (Lawrence et al., 2013; Musuuza et al., 2013; Viron & Stern, 2010). Recommended solutions to this problem include increased involvement by Psychiatric Nurses (Scott & Happell, 2011) and Integrated Health Care systems that combine medical care with community mental health care (Colton & Manderscheid, 2006). Other suggestions involved integrating Case Managers, typically social workers with a bachelor's degree, to help coordinate medical care. Peer Advocates who are former or current patients at the CMH agency have also been used to assist individuals with obtaining and complying with recommended medical care.

Cognitive impairments that often accompany a serious mental illness necessitate additional help such as completing test directions properly (Lawrence & Kisely, 2010). Currently, the U.S. health system is very fragmented, resulting in unmet treatment needs and decreased health (Croft & Parish, 2012). Although survival rates are high with early detection, colorectal cancer screening is frequently ignored, resulting in 60% of cases remaining undiagnosed until later stages (American Cancer Society, 2014). This lack of completion may be due to the intensive preparation and controversy regarding methods of screening (Beydoun & Beydoun, 2007). Kold et al. (2010) demonstrated that persons with higher instances of primary care visits, such as patients with mental illnesses, are

more likely to be referred for screening. However, treatment or diagnostic overshadowing

mitigates this increased instigation of early detection among those with mental illnesses

(Henderson et al., 2011; Howard et al., 2010).

This research examined potential barriers to colorectal cancer screening in hopes

that identified barriers to this type of screening for those with mental illness might apply

to other preventive screenings. Beydoun and Beydoun (2007) evaluated 37 published

research articles pertaining to barriers to colorectal cancer screening, finding that none of

these studies took into consideration the special needs of people with mental illness or

people with mental illness who received care from a CMH agency. Once barriers to

preventive healthcare are identified, this information can be used as part of a

comprehensive health integration model of care at a CMH agency or a primary medical

provider's practice. The goal of this research was therefore to determine which variables

help to predict whether or not people with mental illness who obtain care from a CMH

agency complete colorectal cancer screening.

This review of the literature on people with mental illness and colorectal cancer

screening begins with a discussion of disparities in life expectancy, medical care, and

cancer prevention. This followed by a synopsis of the HBM's relationship to this study

and the controversy surrounding recommendations for colorectal cancer screening. Based

on the findings from this search, my review of the literature on people with mental illness

and colorectal cancer screening will first highlight the Health Belief model; this general

overview will be followed by a discussion of disparities between those with mental

illnesses and the general population in terms of life expectancy, medical care, and cancer

prevention. Subsequently, colorectal cancer and screening are discussed explicitly, followed by barriers to screening for colorectal cancer, including mental illnesses. The literature review attempts to gather information that answers the central research question, "What are the variables that determine colorectal cancer screening completion?"

Literature Search Strategy

In order to gather literature relevant to the proposed study, I consulted multiple general and specific databases related to the topic at hand, including Google Scholar; MedScape; MedLine; and the websites for the American Cancer Society, Centers for Disease Control and Prevention, and gastroenterology specializations. Search terms queried included *cancer prevention; screening; colorectal cancer; and disparities in colorectal cancer treatment and prevention*. All search terms were surveyed alone and with the limiter *mental illness*. After key authors in the field were determined based on the initial search, I conducted a final search to determine whether additional pertinent articles were available by these seminal researchers, which returned no additional search results with relevant data. After discarding 15 articles due to lack of relevance, being out of date, or methodological issues, the combined results from Google Scholar, MedScape, and Medline consisted of 57 peer reviewed, scholarly articles that were published within the last 10 years; I synthesized the relevant data from these studies for my own literature review. Additional demographic and statistical data from U.S. government reports, the Michigan Department of Health, and the American Cancer Society returned an additional 10 sources that provided information essential to understanding the problem under study.

Finally, three seminal works on the HBM, created the theoretical framework for the proposed study, which augmented the literature review.

Theoretical Framework

HBM

The theoretical framework for this study is the HBM. The HBM attempts to predict health behaviors and to explain them (Conner & Norman, 1996). Hochbaum, Rosenstock, and Kegles developed the HBM in the 1950s for the United States Public Health Service. In the 1970s, Rosenstock and Becker updated the model to its current instantiation used for this research (Rosenstock, 1974), determining that a person will comply with health related action in the event that he or she assesses the disease as preventable, that a particular action will prevent that disease, and that he or she will be successful in implementing that action (Conner & Norman, 1996). The predictive model has been used for preventative health behaviors, sick role behaviors, and clinical use. The constructs of the model included perceptions of the following: risk of getting the condition, seriousness of the condition and consequences, barriers, benefits, cues to action, and self-efficacy (Glanz, Rimer, & Viswanath, 2015).

This model for healthcare in relation to colorectal cancer screening can be synthesized as follows:

- Perceived Susceptibility: The risk of colorectal cancer and knowledge of this risk. Is the risk high enough to do anything about it? What are my chances of getting this disease?

- Perceived Severity: How will my life change if I get cancer? Do I have it now and not know it?

- Perceived Barriers: I'm embarrassed to have this test done. I can't take the bus or a cab to the appointment. I can't get anyone to go with me. I don't understand the preparation for the test. I can't get to the store to buy the product recommended. This test might hurt and the prep might make me sick.

- Perceived Benefits: I might be able to prevent colorectal cancer. I won't have to worry about this for a long time after the test is done. My loved ones want me to get it done and my medical provider recommended it due to risk factors. One of the variables being tested is whether or not a person understands the need for colorectal cancer screening. Embarrassment as a potential barrier will also be studied.

- Cues to Action: A medical provider recommended that this test be done and my family wants me to get it done as well.

- Self-Efficacy: Am I confident in my ability to do the test and to do it correctly? Understanding and being educated on the colonoscopy preparation is another variable being evaluated. Transportation is another factor in being self-sufficient. For colonoscopies, transportation and having someone present during the procedure might also be a variable affecting colorectal cancer screening completion.

The research questionnaire aligns with research hypothesis as follows:

- Perceived Benefits, Susceptibility, and Severity: Survey questions 13 through 17 with variables that include preference on type of test resulting in completion of screening, acquisition of screening at proper age, and symptoms prompting screening.

- Perceived Threats (Barriers): Survey questions 7 through 10 with variables that include embarrassment, fear of pain, fear of cancer, and anxiety.

- Cues to Action: Survey questions 2, 3, 5, 6, 11and 22 with variables that include being told to get the screening, type of screening that increases compliance, completing testing when asked, symptoms prompting testing, knowing someone who had colorectal cancer, and compliance based upon who asked the person to get the testing done.

- Self-Efficacy: Survey questions 1, 4, and 12 with variables such as transportation, physical ability to complete screening, and being able to understand the procedure preparation.

- Modifying Variables: Survey questions 18-21 which are demographics and the role they play on completion of colorectal cancer screening such as age, gender, race, and education level.

For the purpose of this study, all of these factors were examined to determine their effects on patients' likelihood to receive colorectal cancer screening. In addition, I examined the data to determine whether a difference exists in these variables when patients with and without mental illnesses are examined, based on researchers' assertions that there is a disparity in health care for people with mental illnesses. This model was

chosen because it provided a comprehensive and validated understanding of patient behavior, which may provide insight to colorectal cancer screening among patients with mental illnesses.

Disparities in Life Expectancy for People with Mental Illnesses

In 2008, it was estimated that 46.4% of Americans experienced mental illness and those with chronic mental illness would live 15-20 years less than people without mental illness (Kessler et al., 2005; Wahlbeck, Westman, Nordentoft, & Gissler, 2011). Because the average life expectancy in the United States of American in 2010 and 2011 was 78.7 years (Hoyert & Xu, 2012), this suggests that persons with mental illness live an average of 58.7 years of age. These statistics cannot solely be blamed on suicide because about 80% of excess deaths are associated with physical health conditions as opposed to suicide (Lawrence, Hancock, & Kisel, 2013).

Lifestyle, poor financial status, side effects of medication, and inadequate medical care are some of the variables that affect the life expectancy of these individuals. Medical illnesses accompany psychiatric illnesses by as much as 71% (Lyketsos, Dunn, Kaminsky, & Breakey, 2002). Many of the deaths from medical conditions are preventable through screening and early detection (Viron & Stern, 2010). The lack of screening and preventative care among people with mental illnesses may be contributing to the shortened life expectancy (Kessler et al., 2005 and Wahlbeck et al., 2011).

Disparities in Medical Care for People With Mental Illnesses

Some authors in the United States have suggested that people with mental illnesses received less and lower quality care than those without mental illnesses

(Bjorkenstam et al., 2013; Mitchell, Malone, & Doebbeling, 2009). Mitchell et al. (2009) reported that disparities in the medical care of people with mental illness have persisted at varying magnitudes despite an increase in medical provider contacts. A study of 6,294,339 individuals in Sweden showed that poorer quality of medical care was received by people with mental illness compared to nonmentally ill people with the same medical conditions (Bjorkenstam et al., 2013). Bjorkenstam et al. (2013) based this decision in part by tracking 72,187 deaths of people with a mental illness and comparing them to nonpsychiatric deceased individuals using three quality indicators: the proportion of avoidable hospitalizations, case death rate after myocardial infarction and statin use among diabetic patients.

Another example of medical disparities for people with mental illness is the higher prevalence of undetected metabolic syndromes and infectious diseases. Rothbard et al. (2009) documented this increased prevalence among 656 people admitted to two inpatient psychiatric units (Rothbard et al., 2009). Laboratory results showed that 10% of these patients had HIV, 32% had Hepatitis B, 21% Hepatitis C, 7% had elevated glucose levels, and 22% elevated total cholesterol. The treatment team at the hospital did not know about Hepatitis B in 95% of the patients, 50% of those with Hepatitis C, 21% of those with HIV, 89% of people with high cholesterol, 97% of people with high triglycerides, and 18% of people with high blood sugar were missed. As with much of the literature, however, Rothbard et al. (2009) did not examine whether or not patients were aware of these conditions, whether or not the person had healthcare insurance and how

many medical provider visits were made in the past year to determine whether the primary medical provider was aware of these conditions.

In short, the specific factors affecting patient care have not been examined to determine which barriers have the most effect on the care disparities for those with mental illness. Overall, support for disparities in medical care exists for people with mental illness and attempts to provide some of the reasons behind this yet the literature has not specifically identified barriers to screening and preventative care. By identifying barriers to colorectal cancer screening completion, the goal is that a diagnosis of colon cancer does not continue to be part of the wide range of disparities in medical care for people with mental illness.

Lessening Disparities in Care for People With Mental Illnesses

In order to provide quality care for all patients, including those who have mental illnesses, it is essential to identify barriers to care and to find strategies to overcome those barriers. The most pressing, and yet least examined, of these potential barriers is diagnostic or treatment overshadowing.

Diagnostic or treatment overshadowing. Some researchers suggested that the lack of medical treatment in people with mental illness resulted from a condition called diagnostic or treatment overshadowing (Henderson et al., 2011; Jones, Howard, & Thornicroft, 2008). Diagnostic overshadowing means that a health care professional may attribute physical complaints to the patients' mental illness as opposed to a legitimate medical condition (Henderson et al., 2011). Treatment overshadowing suggests that a medical provider might not conduct the same treatment for the general population as he

or she would for people with learning disabilities, minorities, and people with mental illnesses.

Two studies which showed that people with mental illness and ischemic heart conditions were less likely to have cardiac catheterizations than the general public exemplified treatment overshadowing (Lawrence, Holman, Jablensky, & Hobbs, 2003; Druss, Bradford, Rosenheck, Radford, & Krumholz, 2000). Sullivan, Han, Moore, & Kotria (2006) studied admissions in people with diabetes (with and without a mental illness) who presented to an emergency department. This study was extensive and used a sample size of 4,275 patients over four and a half years. A delineation was made between people with schizophrenia or bipolar disorder and those with anxiety and depressive disorders. Researchers indicated that those with a mental illness were less likely to be hospitalized than those without a mental illness. Those with non-psychotic disorders (depression and anxiety) and diabetes were even less likely to be admitted to the hospital than the control population. Diagnostic overshadowing was noted in a research study by Howard et al. (2010) who suspected blaming physical complaints on the psychiatric illness was the reason for a lack of quality medical care and diagnosis of cancer in people with mental illness.

Overcoming diagnostic and treatment overshadowing. Reasons for this phenomenon have rarely been researched where mental illness is concerned (Jones et al., 2008). One study examined emergency room staff and care of people with mental illness where diagnostic overshadowing was suspected. Interviews were conducted with patients, and a majority thought that their physical symptoms were being seen as part of

their mental illness, instead of due to a physical illness. To compensate for diagnostic overshadowing, the researchers recommended that psychiatric staff be included in emergency room care (Henderson, van Nieuwenhuizen, Kassam, et al. 2011).

Kisely et al. (2012) studied mortality among people with mental illness in Australia using a large sample of 2,958 people who were ordered to have community mental health treatment and 2,958 controls (those with a mental illness who did not get treatment from a community agency). Kisely et al. (2012) indicated that people who received community mental health interventions had lower mortality rates even three years after the study. It was unclear whether or not an integrated medical/psychiatric model was in place at that particular community mental health agency. Kisely et al. (2012) suggested that treatment orders might help to reduce mortality rates due to increased contact with health care professionals. If diagnostic and or treatment overshadowing is identified as a barrier to successful healthcare, then these interventions may be able to be put in place.

Perhaps medical providers choosing to work with clients who have mental illness are more aware of the needs of this population group. Registered Nurses also work within the realms of the CMH setting with the ability to do nursing assessments (which may or may not include preventative health care recommendations) and patient education. One of the very few studies on Integrated Healthcare that has been published assessed Veteran Health facilities that were at the top and bottom of medical quality of care. Kilbourne et al. (2012) indicated that in-person contacts with medical providers characterized sites with improved patient outcomes, whereas limited communication and stigma for mental

illness characterized the least effective sites. Therefore, increased communication, as practiced by Integrated Healthcare, could help with the disparities experienced by people with mental illness in clinical settings.

Disparities in Cancer Prevention and Care for People With Mental Illness

Some researchers suggested that people with mental illnesses may have an increased prevalence of cancer incidence. Pandiani, Boyd, Bank, and Johnson (2006) found that the incidence of cancer in people with mental illness is 2.5 times that of the general population and in men younger than 50, it is 6.6 times that of the general population. Kisely, Crow, and Lawrence (2013) differed by discovering that there was a 30% higher mortality rate in people with a psychiatric illness even though the incidence of cancer was the same as that of the general population. Similarly, Howard et al. (2010) reported that diagnostic overshadowing may contribute to the unequal recognition of cancer cases in psychiatric patients. In a study of excess mortality from cancer, in people with mental illness, Musuuza et al. (2013) pointed out that substance abuse, smoking, and hepatitis B and C have a higher prevalence in people with mental illness; however, increased mortality could be from late stage identification of disease and inadequate treatment of such. Thus, it seems that in addition to the recognition of medical conditions, preventive healthcare, particularly screenings for cancer, may also be lacking in mentally ill populations.

Lord, Malone, and Mitchell (2010) did a comparative analysis of people with and without mental illness in regard to preventive medical care and screenings. Thirteen health domains were used, including colonoscopy, mammograms, and cholesterol

screening. Inferior medical care was noted in people with schizophrenia in relation to osteoporosis, blood pressure, vaccinations, mammography, and cholesterol monitoring. Drus et al (2002) indicated that even with medical provider visits, persons with psychiatric disorders (including substance abuse) were at risk for a lower rate of preventive services. Preventive cancer screening is especially important in people with mental illness because these individuals have been demonstrated as dying of cancer 10 years earlier than those with cancer who did not have a mental illness (Musuuza et al., 2013). This fact may be especially observable in cancers for which there is little awareness even in the general population, such as colorectal cancer.

Colorectal Cancer Statistics in the General Population

In the United States of America, the lifetime risk of getting colorectal cancer is 1:20; it is the second most commonly diagnosed cancer in addition to being the third leading cause of cancer deaths (American Cancer Society, 2014). Colorectal cancer screening is important because there is a 90% survival rate after 5 years once colorectal cancer is detected and treated (American Cancer Society, 2014). Unfortunately, only 4 out of 10 cases of colorectal cancer are found at the early stages (ACA, 2014). The American Cancer Institute (2014) points out that about 50% of people who should get colorectal cancer screening do not do so. African Americans have higher colorectal cancer diagnosis than other ethnic groups and they also have a lower survival outcome (Hamlyn, 2008). Jewish people of European descent (Ashkenazi Jews) also have a very high risk of getting colorectal cancer due to a hereditary genetic variant (Rosenberg, 2014). A

variable being assessed will be whether or not race has any bearing on completion of colorectal cancer screening.

Colorectal Cancer Screening

Controversy exists as to whether or not colonoscopies should be the preferred screening for colorectal cancer. A colonoscopy requires extensive preparation: adhering to a liquid diet the day before the test (nothing with red dye), drinking poor tasting fluids in order to clear the bowels which results in diarrhea, and needing someone to take the person to the test and home again (American Cancer Society, 2014). A virtual colonography through a CT Scan requires the same prep in addition to a tube inserted in the rectum to add air in order to obtain pictures of the intestines. If a polyp is found, a colonoscopy will need to take place for polyp removal. According to the HBM, extensive preparation may damage a patient's self-efficacy and therefore impede health action (Glanz et al., 2015).

Another test for colorectal cancer screening is the Fecal Occult Blood Test (FOBT). For this test, a person merely needs to put a sample of feces on a slide and give it to the medical provider or mail it in to a company that does analysis of this type of test (Bandi, Cokkinides, Smith, & Jemal, 2011). Ideally a swab from two parts of the same stool is put on the glass slide, and the person hopefully did not have any foods containing red dye prior to the test. The test is to be repeated at least twice with two different bowel movements. If blood is detected, a colonoscopy will need to take place. The Fecal Immunochemical Test (FIT) has a preparation similar to the FBOT but does not require

any dietary or medication restrictions (Quintero et al., 2012). Again, if something is found in this test, a colonoscopy needs to take place.

There are pros and cons to the various tests in relation to comfort for the patient and accuracy but it appears that if a problem is found then a colonoscopy is usually recommended (Quintero et al., 2012). The United States Preventive Services Task Force website was consulted regarding the status of preferred colorectal cancer screening tests and at this time, a change in standards is taking place through research designed to determine which test is the preferred test (U.S. Preventative Services Task Force, 2008). This finding highlighted the need for further research in to colorectal cancer screening recommendations. Identifying barriers to colorectal cancer screening is still needed so that rates of early detection can be increased (ACA, 2014; American Cancer Institute, 2014). Patient preferences for colorectal cancer screening showed no dominant choice in a study of one hundred participants at a family practice medical office. This article recommended that medical providers keep in mind patient choice for methods of colorectal cancer screening when choosing a test (Leard, Savides, & Ganiats, 1997).

Barriers and Contributors to Colorectal Cancer Screening

According to a careful review of literature, no available studies examined the factors contributing to colorectal cancer screening in the mentally ill. However, some recent studies within populations without mental illnesses identified some contributing factors to colorectal cancer screening (Almadi et al., 2015; Ghobadi, Noroozi, & Thamasebi, 2016). Using the HBM, Ghobadi et al. (2016) examined 600 men and women over the age of 50 living in Bushehr, Iran. Through logistic regression, Ghobadi et al.

determined that three aspects of the HBM, self-efficacy, perceived barriers, and perceived

benefits from treatment, significantly contributed to colorectal cancer screening

completion ($P < .01$). A potential limitation of Ghobadi et al.'s study was that the sample

was from a limited location.

Almadi et al. (2015) used the HBM in a study of a sample of the general

population in Saudi Arabia. Almadi et al. assessed attitudes, knowledge, family history of

colorectal cancer, and behavior willingness to undergo colorectal cancer screening.

Barriers to colorectal cancer screening included: knowledge of need for colorectal cancer

screening, access to health care delivery systems, lack of time for those needing

screening, transportation, financial barriers, fear from getting unwanted results, and

embarrassment or shame. As with Ghobadi et al.'s (2016) study, Almadi et al.'s findings

may not generalize to the present study because of significant differences in the samples

i.e. insurance status, cultural factors, Iranian health care systems, and lack of strictly

mentally ill subjects. Unlike Almadi et al. (2015) and Ghobadi et al. (2016), Sohler,

Jeran, and Franks (2015) addressed the influence of several health belief model variables

on individuals within the United States; however, the sample still consisted of those

without mental illnesses. Using secondary observational data from a randomized

intervention trial, Sohler et al. examined five health belief model variables' influence on

colorectal cancer screening completion one year after the trial: screening knowledge, self-

efficacy, stage of readiness, barriers, and discussion with a provider. Sohler et al.

determined that three of the variables independently predicted screening completion: self-

efficacy, discussion with a provider, and readiness. Together, the factors provided an

improved model for predicting colorectal cancer screening within the general U.S. population, as represented by the sample (Sohler et al., 2015).

There is high publicity for women to get mammograms through breast cancer awareness events and use of the pink ribbon; however, there is little for colorectal cancer aimed at any gender. Molina et al. (2004) reported that only 12.3% of women receiving mammography who were eligible for colorectal cancer screening were current. For those getting healthcare through a community low-income medical center, a mixed study of 23 people and 10 physicians found four themes related to colorectal cancer screening:

"1) Unscreened patients cited lack of trust in doctors as a barrier to screening whereas few physicians identified this barrier;

2) Unscreened patients identified lack of symptoms as the reason they had not been screened;

3) A doctor's recommendation, or lack thereof, significantly influenced patients' decisions to be screened;

4) Patients, but not their physicians, cited fatalistic views about cancer as a barrier. Conversely, physicians identified competing priorities, such as psychosocial stressors or comorbid medical illness, as barriers to screening (Lasser, Avanian, Fletcher, & DelVecchio, 2007)." Although this study was small, it was pertinent to note the concern of medical providers on variables other than routine cancer screenings which, as listed previously, supports the multitude of comorbid medical conditions in people with mental illness.

The patients' number of visits has been a metric of determining efficacy for cancer treatment. In the general population, Ferrante et al. (2013) noted that colorectal cancer screening increases with higher use of primary care provider appointments, and Sohler et al. (2015) similarly found that discussions with a care provider increased the likelihood that a person would receive colorectal cancer screening. Conversely, Lyratzopoulos et al. (2013) analyzed data from the National Audit of Cancer Diagnosis in Primary Care 2009-10 to determine the usual number of symptomatic medical visits before someone was diagnosed with cancer and referred to a specialist. In Lyratzopolous et al.'s study, the authors concluded that the number of visits was inconsequential, and the researchers suggested that research and policy initiatives be used to improve the sensitivity of symptom appraisal by general practitioners to detect cancer symptoms. Meissner, Klabunde, Breen, & Zapka (2012) had primary care providers identify barriers to colorectal cancer screening and found that tests were not done despite being recommended because of patients' inability to pay and patients not considering colorectal cancer a threat. Two of these variables were tested in this quantitative study (i.e., "What is the relationship between understanding why colorectal cancer screening is needed and completion of the test?" and "What is the relationship between gender and completion of colorectal cancer screening?"

Mental Illness and Colorectal Cancer Screening

Kold et al. (2010) examined 855 veterans at a Veterans Affairs Medical Center with and without psychiatric illnesses and determined that veterans with mental health diagnoses were significantly less likely to receive screening for colorectal cancer than

those with a similar number of outpatient visits but without a psychiatric diagnosis. Friedman, Puryear, Moor, & Green (2005) performed a multivariate analysis on 196 women with psychiatric illness making routine medical visits. Friedman et al. (2005) indicated that physician recommendations according to screening guidelines are of utmost importance in this population particularly for breast and colorectal cancer. Because of the discrepancy in the literature regarding the different medical treatment of people with and without mental illnesses, one of the variables being tested for this particular research study is whether or not the person was advised to get colorectal cancer screening.

Deficiencies in the Data

Overall, this study could help to explain whether or not people with mental illness are aware of the importance of colorectal cancer screening, whether or not it has been recommended by a medical provider, if colorectal cancer screening actually took place and barriers to colorectal cancer screening. In addition, I examined whether or not a health assessment by a CMH Registered Nurse included colorectal cancer screening recommendations during treatment. Because Integrated Healthcare (medical and psychiatric) is so new, it is hoped that this research will help CMH agencies take in to consideration the importance of colorectal cancer screening, develop ways to increase rates of test completion, and utilize the yearly health assessment as a tool for preventive healthcare recommendations, especially for patients with mental illnesses.

Colorectal cancer screening was chosen because it is the most complex and difficult screening test to obtain, and thus the most potentially damaging based on the

HBM. More research could be conducted to find out whether or not barriers to colorectal cancer screening apply to other preventive tests such as mammograms. Currently, there are no studies about colorectal cancer screening barriers in people with mental illness.

Summary

Patients with mental illnesses experience deficient medical attention (Bjorkenstam et al., 2013; Rothbard et al., 2009), perhaps resulting in the increased rates of early death. Similarly, colorectal cancer, though one of the most common types of cancer, remains undetected in a majority of cases until past the early stages (American Cancer Society, 2014). The HBM may provide guidance for understanding the decreased rates of colorectal cancer screening completion. While Kold et al. (2010) noted that increased primary care visits may improve a patient's likeliness of receiving a referral for screening, these effects may not be felt in the mentally ill population despite their increased rates of primary care visits, due to prejudices by primary care providers, including diagnostic or treatment overshadowing (Howard et al., 2010). The proposed research will examine potential barriers to colorectal cancer screening in hopes that identified barriers to this type of screening for those with mental illness might improve the rates of preventive screenings for this population.

Chapter 3: Methodology

Introduction

This research was written, in order to determine which variables might influence colorectal cancer screening completion, in people with persistent and severe mental illness, who received services from a CMH agency. The following chapter outlines the design method, as well as the research population, sampling procedures, and operationalization of research variables. This chapter also delineates the instrumentation, data analysis, informed consent, and threats to validity.

Research Design and Rationale

This research utilized a quantitative, correlational survey design. A quantitative method, seeks to examine for statistically significant effects or relationships, between quantifiable constructs (Howell, 2010). One of the limitations of a quantitative design is that it will not fully examine the underlying perceptions and experiences that a qualitative design could provide. In addition, quantitative designs usually employ the use of questionnaires or archival data. Due to the nature of this study and the need to safeguard anonymity, a qualitative approach with personal interviews and observations, would not provide the dependability or credibility of anonymous survey tools. I chose a survey design because the participants were asked to complete a series of questionnaires and their response was analyzed in an economic and practical manner. I specifically chose a correlational survey design because this is used to assess the relationships between variables (Creswell, 2005). Correlation designs indicate where associations exist, but do

not provide causation. As a result of these decisions, I conducted a quantitative, correlational, survey design.

The focus of this study was to investigate the effect that these independent variables had on completing colorectal cancer screening. The independent variables corresponded with access to transportation, being told to get colorectal cancer screening, understanding the colonoscopy preparation, being physically able to do the preparation, understanding why colorectal cancer screening is needed, embarrassment, gender, race, and age. The dependent variables corresponded to having completed colorectal cancer screening. Each of these concepts was measureable through responses to a survey instrument.

Target Population

The population of interest for this research were CMH clients. The sample consisted of 377 individuals ages 50-70 (see sample calculation below), who received treatment at an east- and at a west-side CMH office in Detroit, Michigan. The State of Michigan's latest demographic information on people getting mental health services from a CMH in 2013 is summarized in Table 1.

Table 1

Michigan-Wide Demographic Information for Individuals Receiving Care From a CMH

Demographic	*n*	*%*
Gender		
Male	98,902	
Female	99,537	
Age		
27 – 64	119,999	
65 - 70	8,839	
Ethnicity		
White		58.00%
African-Americans		23.00%
Asian		0.03%
Native Hawaiian or other Pacific islander		0.03%
Hispanic or Latino		3.92%
Multiracial		5.00%
Other race		2.88%
Housing		
With relatives		48.78%
Private residence without relatives		30.17%
Homeless shelter or homeless		4.12%
Specialized residential		2.35%
General residential		2.01%
Supported independent living program		1.08%
Total household income		
Below $10,000		53.51%
$10,001 - $20,000		13.77%
$20,001 - $30,000		3.90%
$30,001 - $40,000		1.45%
$40,001 - $50,000		0.98%
Income over $60,000		0.63%
Unreported		25.76%
Insurance		
Medicaid		65.21%
Medicare		19.51%
Commercial health insurance		8.62%
Employment		
Full-time		3.82%
Part-time		5.49%
Unemployed and looking for work		22.80%
Homemaker		60.79%
Education		
Less than high school		17.63%
High school completion		28.78%

Note. Adapted from *Report for Section 404, Community Mental Health Service Programs Demographic and Cost Data 2013*, by Michigan Department of Community Health, 2014.

Diagnosis was not part of this data set, nor was diagnosis elicited for this research

due to too many confounding variables impacting accuracy. For example, when a patient

is given an initial assessment, one diagnosis may be given but as more information

becomes available over time, the diagnosis may change several times. Individuals under

ages 75 years were not included in the data set. Overall, the majority of people served

were equally male and female, living with relatives or someone else in a private

household, had a total household income of less than 10,000 dollars, were unemployed,

and have Medicaid.

Sampling and Sampling Procedures

To gather participants from the aforementioned population, I gained permission

from a CMH agency in order to administer surveys to patients (Appendix X). Due to the

purposive targeted sample, a convenience sampling method was used to collect

participants from the two centers. Using this sampling method, it was important to

contact a pool of individuals larger than the necessary sample size as calculated for data

analysis. This was done so that unfinished or bizarre responses could be discarded

without affecting the statistically recommended minimal sample size. Each participant

must have been a patient at one of the two corresponding centers. Individuals were

required to be between 50-70 years old and must not have had a legal guardian. All of the

participating individuals must have had insurance to avoid variables of the uninsured.

According to a study by the National Adult Literacy Survey, about 47% of

Detroiters are illiterate (Detroit Literacy Coalition, 2008). Therefore, questions were

worded using easily-understood language and a photo was used to explain colorectal

cancer screening. A sign was put up in each lobby, requesting volunteers who met the criteria, to fill out the questionnaire. The questionnaire was put on a clipboard at a table in each lobby, which allowed privacy when writing results so that the person doesn't have to complete the form at a table next to others (Appendix Z). Strict adherence to the university and governmental guidelines for research participation were enforced. No names or identifying data were recorded. A locked box was made available where participants could place the completed surveys.

Sample Size Requirement

Tabachnick and Fidell (2012) suggested using the formula $n > 50 + 8(m)$ to generate the minimum required sample size. Within the formula, m corresponds to the number of predictors and n corresponds to the minimum sample size. With a total of 8 predictors being used in the study, I used Tabachnick and Fidell's (2012) formula to calculate that 114 participants would need to be gathered to justify empirical validity.

Procedures for Recruitment, Participation, and Data Collection

After gaining permission from the CMH agency, I placed a flyer in each lobby, requesting volunteers who met the criteria to fill out the survey. The questionnaire (Appendix D) was placed on a clipboard at a table in each lobby, which allows privacy when writing results. The voluntary nature of the study was explained to participants and withdrawal was permitted at any time during the course of the survey. Prior to completing the survey questionnaire, a consent form was provided to participants (Appendix C). The consent form clearly indicated that care and treatment of any individual would not be affected by participation or lack thereof, in the study.

The survey took approximately 5 minutes to complete. Demographic information regarding age, race, gender, education level, and type of insurance were gathered. Identifying information such as name, phone number, or address were not collected during the process. Following the demographic section, participants were asked to complete a series of questions about the colonoscopy procedure regarding: prior knowledge, previous experience, physical capability, having transportation, and potential embarrassment from procedure. A locked box was made available where participants could place their completed surveys. At no time was I made aware of who did or did not complete the survey; there were also no follow up requirements of the survey participants.

Pilot Study

I utilized a pilot study to assess the appropriateness of the self-created colonoscopy questionnaire. The pilot study was done to make sure that participants were accurately interpreting the questions. If interpretation appeared to be problematic, a rewording was done. For example the use of *stool sample* was replaced with *poop* per the request of reviewers, many of whom have worked with this population for over twenty years. Once the methodology of the research design and approach were justified, then the full study was conducted. The results of the data from the pilot study would remain independent from the findings of the complete data set.

A pilot (feasibility) study is a preliminary investigation to collect data and assess the logistics of the data analysis procedures prior to the full study being conducted. Pilot studies are typically applied to improve the efficiency and overall quality of the study.

While conducting a pilot study, possible drawbacks and deficiencies in the data collection and data analysis procedures may be evident (Creswell, 2009). These limitations can be fixed by placing more resources, time, and money towards the full study.

Instrumentation

The participants completed a voluntary questionnaire. The self-created instrument had not been tested for reliability or validity; thus, an expert panel was employed to provide content, construct, and consensual validation of the instrument using agency staff familiar with the clientele. Degrees of staff included: Bachelor in Social Work (BSW), Master's in Social Worker (MSW), Psychiatrists (DO and MD), Bachelor in Nusring (BSN), and Master's in Psychology (LLP) who read and critiqued the instrument in order to assess whether or not verbiage of the questionnaire was adequate in order to establish the various validations. There were no factors or composite scores being generated, thus I did not calculate internal consistency coefficients, per Creswell (2012). To justify the reliability of the instrument, a split-half reliability was conducted where the questionnaire was split in two sections, and the responses for each section of the test were compared, in alignment with Feldt and Brennan (1989). The pilot study was used to ensure that the participants were interpreting the questions accurately. Appendix Z contains the survey tool that was administered to participants.

Operationalization

The key variables in this quantitative correlational study corresponded to having completed colorectal cancer screening, transportation, being told to get colorectal cancer screening, understanding the colonoscopy preparation, being physically able to do the

preparation, understanding why the colorectal cancer screening is needed,
embarrassment, gender, race, and age. Operationalizations of these variables are defined
below.

Dependent Variables

Completed colorectal cancer screening: Dichotomous variable (yes/no)
corresponding to having completed colorectal cancer screening by colonoscopy.

Having colorectal cancer in the past or currently: Dichotomous variable (yes/no)
corresponding to having completed screening.

Independent Variables

Access to transportation: Dichotomous variable (yes/no) corresponding to
individual's ability to have someone willing to drive them to the facility, stay with the
person during the cancer screen, and take them home.

Being told to get colorectal cancer screening: Dichotomous variable (yes/no)
corresponding to individual being advised to receive CRC screening.

Being physically able to do the preparation: Dichotomous variable (yes/no)
corresponding to individual's ability to complete the prep which in involves clear liquids
and diarrhea.

Understanding why colorectal cancer screening is needed: Dichotomous variable
(yes/no) corresponding to individual understanding why the colorectal cancer screening is
necessary.

Embarrassment: Dichotomous variable (yes/no) corresponding to individual
experiencing feelings of embarrassment over the colonoscopy procedure.

Fear of pain: Dichotomous variable (yes/no) corresponding to individual experiencing feelings of embarrassment over the colonoscopy procedure.

Completion of FOBT procedure: Dichotomous variable (yes/no) corresponding to individual completing the FOBT procedure.

Symptoms of colorectal cancer: Dichotomous variable (yes/no) corresponding to individual demonstrating symptoms of colorectal cancer.

Anxiety: Dichotomous variable (yes/no) corresponding to individual being anxious over the colonoscopy procedure.

Recommendation for cancer screening: Categorical (nominal) variable corresponding to individual who recommended participant to undergo cancer screening.

Fear of cancer diagnosis: Dichotomous variable (yes/no) corresponding to individual being fearful of receiving a diagnosis for cancer during the procedure.

Race: Categorical (nominal) variable corresponding to an individual's ethnicity or race were be measured in the demographic portion of the survey.

Gender: Categorical (nominal) variable corresponding to an individual's gender were measured in the demographic portion of the survey.

Age: Continuous variable corresponding to an individual's age were measured in the demographic portion of the survey. The age range is 50-75.

Education: Ordinal variable corresponding to an individual's education level were measured in the demographic portion of the survey.

Knowing someone who had/has colorectal cancer: Categorical (nomoinal) variable corresponding to completion of colorectal cancer screening.

Data Analysis Plan

Data were compiled into SPSS version 22.0 for Windows. Descriptive statistics, frequencies, and percentages were analyzed to describe the trends of the research variables. Descriptive statistics were presented to describe the sample demographics and the research variables used for the analyses. Frequencies and percentages were calculated for any nominal (i.e., categorical) variables of interest. Means and standard deviations were calculated for any continuous (i.e., scale or ratio) data of interest (Howell, 2010). Data were screened for accuracy and missing data. Questionnaires that were not fully completed were potentially removed from further analysis and inferential tests.

Research Questions and Hypotheses

Research Question 1: What is the relationship between embarrassment, fear of pain, fear of cancer, anxiety and completion of colorectal cancer screening?

• H01: There is no relationship between embarrassment, fear of pain, fear of cancer, anxiety and completion of colorectal cancer screening.

• HA1: There is a relationship between embarrassment, fear of pain, fear of cancer, anxiety and completion of colorectal cancer screening.

Research Question 2: What is the relationship between transportation, physical ability to do testing, understanding the preparation for testing and completion of colorectal cancer screening?

• H02: There is no relationship between transportation, physical ability to do testing, understanding the preparation for testing and completion of colorectal cancer screening?

• HA2: There is a relationship between transportation, physical ability to do testing, understanding the preparation for testing and completion of colorectal cancer screening?

Research Question 3: What is the relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

• H03: There is no relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

• HA3: There is a relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

Research Question 4: What is the relationship between being physically able to complete the colonoscopy scope prep and completion of the test?

• H04: There is no relationship between being physically able to complete the colonoscopy scope prep and completing the test.

• HA4: There is a relationship between being physically able to complete the colonoscopy scope prep and completing the test.

Research Question 5: What is the relationship between FOBT vs Scope procedures, age of first screening, and a diagnosis of colorectal cancer?

• H05: There is no relationship between FOBT vs Scope procedures, age of first screening, and a diagnosis of colorectal cancer.

• HA5: There is a relationship between, FOBT vs Scope procedures, age of first screening, and a diagnosis of colorectal cancer.

Research Question 6: What is the relationship between who recommended colorectal

cancer screening, being told to get screened, symptoms of cancer, knowing someone who

had colorectal cancer, and completion of colorectal cancer screening?

•   H06: There is no relationship between who recommended colorectal cancer

screening, being told to get screened, symptoms of cancer, knowing someone who had

colorectal cancer and completion of colorectal cancer screening.

•   HA6: There is a relationship between who recommended colorectal cancer

screening, being told to get screened, symptoms of cancer, knowing someone who had

colorectal cancer and completion of colorectal cancer screening

Chi-square Analyses and Point-Biserial Correlation

To address the research questions, fourteen chi-squares and one point-biserial

correlation were conducted preliminarily to determine which variables have a significant

relationship with completion of colorectal cancer screening. A chi-square is an

appropriate analysis to use when the research is interested in the strength of a relationship

or association between two nominal variables (Howell, 2013). The variables of interest

for the chi-square tests corresponded to: access to transportation, being told to get

colorectal cancer screening, understanding why the colorectal cancer screening is needed,

being able to physically tolerate the prep, fear of pain, completing the FOBT procedure,

fear of being diagnosed with cancer, having symptoms, individual who recommended

cancer screening, anxiety, embarrassment, gender, education, and race. The chi-square

analysis was assessed between the aforementioned variables and the dependent variable –

completion of colorectal cancer screening. A point-biserial correlation was conducted to

assess the relationship between age and completion of colorectal cancer screening. A point-biserial correlation (r_{pb}) is an appropriate analysis when the goal of the research is to evaluate whether a significant relationship exists between a continuous variable and a dichotomous variable (Pallant, 2013).

Prior to analysis, the assumptions of chi-square were assessed. In order for chi-square to operate ideally, the data must come from random samples and the expected frequencies should not be too small. Traditional caution in chi-square examinations is that expected frequencies below five should not make up more than 20% of the cells, and no cell should have an expected frequency that is smaller than one (Pagano, 2009). Another assumption of a chi-square analysis is that observations are independent of one another. This means that participants can only contribute one observation to the data set. To justify this assumption, the row and column totals should be equal to the number of participants (Howell, 2010).

To determine significance of the results, the calculated chi-square coefficient (χ^2) was compared to the critical value coefficient. When the calculated coefficient is larger than the critical value, or the p-value is less than the alpha level of .05, a significant relationship is indicated. In this case, the null hypothesis could be rejected in favor of the alternative hypothesis.

Binary Logistic Regression

After determining which variables had a significant relationship with completion of colorectal cancer screening, a binary logistic regression was used to assess the collective effect of the independent variables on the dependent variable. A binary logistic

regression is an appropriate analysis to use when the dependent variable has two levels

(i.e. dichotomous), meaning there are only two possible outcomes (Stevens, 2009). The

independent variable for a binary logistic regression can be continuous, discrete, or a

combination of continuous and discrete. In this research, the dependent variable

corresponded to completion of colorectal cancer screening (yes/no). The independent

variables corresponded to access to transportation, being told to get colorectal cancer

screening, understanding why the colorectal cancer screening is needed, being able to

physically tolerate the prep, fear of pain, completing the FOBT procedure, fear of being

diagnosed with cancer, having symptoms, individual who recommended cancer

screening, anxiety, embarrassment, gender, education, and race. Only the significant

nominal predictors indicated by the chi-square analysis were placed into the logistic

regression model. Using the point-biserial correlation, if age was found to be significantly

associated with completion of colorectal cancer screening, then this variable was placed

into the logistic regression model as well.

Logistic regressions bypass many of the restrictive assumptions of least-squares

linear regressions (Tabachnick & Fidell, 2013). Linearity, normality, and homogeneity of

variance are not assumed. The major assumption of this analysis is that the dependent

variable needs to be discrete and dichotomous. In addition, the assumptions for removal

of outliers, absence of multicollinearity, and independence of errors were assessed

(Tabachnick & Fidell, 2013).

The overall model was assessed for the collective effects of the independent

variables on the completion of colorectal cancer screening, presented with a χ^2

coefficient. The Nagelkerke R^2 was examined to assess for the percent of variance of the dependent variable accounted by the independent variables. If the overall model indicated significance, the individual predictors were further analyzed. Individual predictors were assessed by the Wald coefficient and significance was determined with an alpha level of .05.

Threats to External Validity

Key threats to external validity correspond to portions of the sample that provide bias towards the situational specifics of the study data collected, the calculated results, or a specific researcher. Furthermore, there may have been covariates or confounding variables that strengthened or weakened the relationships between the variables of interest (Howell, 2010). Because it was not feasible to adjust for every potential covariate, this limitation was accepted and acknowledged in the interpretation of the results. As a result, I implemented additional caution in the interpretation of the study's results, and did not assume that these results could be perfectly generalized towards the population of interest (Creswell, 2005)

Threats to Internal Validity

Several potential limitations exist within the extent of quantitative studies. First, quantitative methodologies are able to examine the research questions and subsequent hypotheses, however they are not able to fully measure the depth and underlying experiences and perceptions of the subjects. As a result, I substituted the degree of richness inherent within a qualitative study for a degree of statistical certainty that these relationships were not established by chance alone (Pagano, 2009).

In order to attain internal validity, causal inferences must be present. Causal inferences can occur when the effect is generated by the cause or when there is no feasible explanation for why the effect exists. Consequently, key threats to internal validity could occur if the sequence of cause and effect are misinterpreted or if there is bias in the selection of the sample.

Ethical Procedures

A researcher conducting a study with human subjects has a responsibility to protect and inform (Bloomberg & Volpe, 2012). When conducting this study, I followed the moral and ethical guidelines presented by federal regulations and the Institutional Review Board (IRB). The following paragraphs provide the proposed approach to provide informed consent and a brief discussion on data retention, storage, and destruction to protect participant's confidentiality.

Informed Consent

An informed consent was marked with an X by the participant who could continue with the survey or not. Because I was also an employee of the agency where the study was taking place, efforts were made to make sure that patients were aware that I would not know who did or did not complete the questionnaire. A poster was put in the lobby with a photo of a colon explaining the procedure. The consent form explained the rest. The questionnaire was put in a secured box by the participant when completed. Any questions or concerns about the study were directed to the IRB staff member at Walden University. Completing the questionnaire was totally voluntary as they were placed on a table with a clipboard and the poster. No identifiable traits or information were used in

the data analysis. I remained in another part of the agency or was at a different location during the study.

Data Storage, Retention, and Destruction to Protect Confidentiality

The survey instrument for this study was designed to reduce the necessity to collect identifiable data. In accordance with federal and IRB guidelines, I safeguarded all data and information in order to protect participants' confidentiality. No names or identifying data were collected. The safeguard measure for data storage is a locked file in my residence where the data will be retained securely for a period of five years after the research is complete. Upon expiration of the five-year retention period, I will permanently delete the data.

Summary

The previous chapter outlined the quantitative design, as well as rationale for the use of this research model. In addition, a population and subsequent sample were delineated and procedures for the gathering of participants were indicated as following a convenience sampling method. The chapter also operationalized the variables which were used to measure the variables of interest, and included the instrumentation and procedures for data collection. The treatment of data and statistical procedures addressing the hypotheses are explained, and include a rationale for such analyses along with the presentation of results. Finally, limitations and ethical concerns were addressed, with special consideration to potential methods which may remedy these difficulties or harms. The researcher adhered strictly to these procedures in gathering and analyzing data in order to cleanly and efficiently address the research problem at hand.

Chapter 4: Results

Introduction

The purpose of the esearch was to determine which variables might influence

colorectal cancer screening completion, in people with persistent and severe mental

illness, who receive services from a CMH agency. The following research questions were

examined:

Research Questions and Hypotheses

Research Question 1: What is the relationship between embarrassment, fear of pain, fear

of cancer, anxiety and completion of colorectal cancer screening?

- H01: There is no relationship between embarrassment, fear of pain, fear of cancer,

anxiety and completion of colorectal cancer screening.

- HA1: There is a relationship between embarrassment, fear of pain, fear of cancer,

anxiety and completion of colorectal cancer screening.

Research Question 2: What is the relationship between transportation, physical ability to

do testing, understanding the preparation for testing and completion of colorectal cancer

screening?

- H02: There is no relationship between transportation, physical ability to do

testing, understanding the preparation for testing and completion of colorectal cancer

screening?

- HA2: There is a relationship between transportation, physical ability to do testing,

understanding the preparation for testing and completion of colorectal cancer screening?

Research Question 3: What is the relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

• H03: There is no relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

• HA3: There is a relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

Research Question 4: What is the relationship between being physically able to complete the colonoscopy scope prep and completion of the test?

• H04: There is no relationship between being physically able to complete the colonoscopy scope prep and completing the test.

• HA4: There is a relationship between being physically able to complete the colonoscopy scope prep and completing the test.

Research Question 5: What is the relationship between FOBT vs Scope procedures, age of first screening, and a diagnosis of colorectal cancer?

• H05: There is no relationship between FOBT vs Scope procedures, age of first screening, and a diagnosis of colorectal cancer.

• HA5: There is a relationship between, FOBT vs Scope procedures, age of first screening, and a diagnosis of colorectal cancer.

Research Question 6: What is the relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer, and completion of colorectal cancer screening?

• H06: There is no relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer and completion of colorectal cancer screening.

• HA6: There is a relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer and completion of colorectal cancer screening

This chapter includes the findings of the data collection process. Descriptive statistics were utilized to examine the trends in variables. Frequencies and percentages were be used to explain trends in nominal variables. Means and standard deviations were calculated for continuous variables. The research questions were examined by a combination of chi-square analyses, point-biserial correlation, and a binary logistic regression. Significance was evaluated at the generally accepted $\alpha = .05$

Data Collection

Frequencies and Percentages of Sample Characteristics

Two CMH Departments located in Detroit, Michigan were the sources of the sample. A sign was placed in each lobby explaining the colonoscopy procedure and another sign asked participants to complete the survey if he or she was a client of the agency, did not have a legal guardian, and was aged 50-75 years of age. Clipboards with the survey and pens were placed on the table so that I avoided potential conflicts of interest from knowing who completed the surveys. The data collection process took approximately three weeks to gather enough surveys. Ten surveys were not part of the

research due to incomplete or bizarre/non-sensical responses. Overall, the plan for the gathering of the research was followed and didn't need to deviate.

A total of 128 individuals participated in the survey. A majority of participants were female ($n = 93$, 72.7%). A majority of participants were African American ($n = 105$, 82%). Most participants had only Medicaid insurance ($n = 59$, 46.1%); however, many participants had both Medicaid and Medicare insurance ($n = 38$, 29.7%). The distribution of participants who used the FOBT ($n = 52$, 46%) and Scope ($n = 61$, 54%) procedures was approximately equal. A majority of participants had completed colorectal cancer screening ($n = 69$, 53.9%). Table 2 presents the frequencies and percentages for the sample characteristics.

Table 2

Frequencies and Percentages for Sample Characteristics

Variable	*n*	*%*
Gender		
Female	93	72.7
Male	35	27.3
Race		
Black	105	82.0
White	12	9.4
Other	1	0.8
No response	10	7.8
Education		
GED	24	18.8
Diploma	66	51.6
Some college	2	1.6
Bachelors	1	0.8
Quit School	35	27.3
Insurance		
Medicaid	59	46.1
Medicare	38	29.7
Medicaid/Medicare	22	17.2
Missing	9	7.0
Procedure used		
FOBT	52	46.0
Scope	61	54.0
Completed colorectal cancer screen		
Yes	69	53.9
No	59	46.1

Descriptive Statistics for Age

Descriptive statistics were used to examine the range, mean, and standard

deviation of the participants' age. Participant ages ranged from 50.00 to 77.00 years old,

with $M = 57.30$ and $SD = 5.06$. A convenience sample was used to survey participants

and the age group of the participants was representative of the population of interest.

Statistical Findings

Research Question 1

Research Question 1 asked, "What is the relationship between embarrassment, fear of pain, fear of cancer, anxiety and completion of colorectal cancer screening?"

> **H01:** There is no relationship between embarrassment, fear of pain, fear of cancer, anxiety and completion of colorectal cancer screening.
>
> **HA1**: There is a relationship between embarrassment, fear of pain, fear of cancer, anxiety and completion of colorectal cancer screening.
>
> To address Research Question 1, a series of chi-square analyses were conducted

to examine the relationship between embarrassment, fear of pain, fear of cancer, anxiety and completion of colorectal cancer screening. A chi-square analysis is an appropriate statistical tool when assessing the relationship between two categorical variables (Howell, 2010). Embarrassment, fear of pain, fear of cancer, anxiety, and completion of colorectal cancer screening were coded: 1 = yes or 0 = no.

> **Embarrassment.** Results of the chi-square indicated significance, $\chi^2(1) = 6.28$, p

= .012, suggesting that there was a significant relationship between embarrassment and completion of colorectal cancer screening. Most participants had completed colorectal cancer screening and were not embarrassed (n = 64 participants). Results of the chi-square analysis between embarrassment and completion of colorectal cancer screening are presented in Table 3.

Table 3

Chi-Square Analysis for Embarrassment and Completion of Colorectal Cancer Screening

	Completion of Colorectal Cancer Screening			
Embarrassment	Yes	No	$\chi^2(1)$	*p*
Yes	2 [6.0]	9 [5.0]	6.28	.012
No	64 [60.0]	47 [51.0]		

Note: Bracketed values display expected counts for each cell

Fear of pain. Results of the chi-square indicated significance, $\chi^2(1) = 7.89$, *p* = .005, suggesting that there was a significant relationship between fear of pain and completion of colorectal cancer screening. Most participants had completed colorectal cancer screening and did not have a fear of pain (*n* = 57 participants). Results of the chi-square analysis between fear of pain and completion of colorectal cancer screening are presented in Table 4.

Table 4

Chi-Square Analysis for Fear of Pain and Completion of Colorectal Cancer Screening

	Completion of Colorectal Cancer Screening			
Fear of Pain	Yes	No	$\chi^2(1)$	*p*
Yes	10 [16.8]	21 [14.3]	7.89	.005
No	57 [50.3]	36 [42.8]		

Note. Bracketed values display expected counts for each cell

Fear of cancer. Results of the chi-square indicated significance, $\chi^2(1) = 4.21$, *p* = .040, suggesting that there was a significant relationship between fear of cancer and completion of colorectal cancer screening. Most participants had completed colorectal cancer screening and did not have a fear of cancer (*n* = 59 participants). Results of the

chi-square analysis between fear of cancer and completion of colorectal cancer screening

are presented in Table 5.

Table 5

Chi-Square Analysis for Fear of Cancer and Completion of Colorectal Cancer Screening

| | Completion of Colorectal Cancer Screening | | | |
Fear of Cancer	Yes	No	$\chi^2(1)$	p
Yes	7	14	4.21	.040
	[11.3]	[9.7]		
No	59	43		
	[54.7]	[47.3]		

Note: Bracketed values display expected counts for each cell

Anxiety and completion of colorectal cancer screening. Results of the chi-square indicated significance, $\chi^2(1) = 11.40$, $p = .001$, suggesting that there was a significant relationship between anxiety and completion of colorectal cancer screening. Most participants had completed colorectal cancer screening and did not have anxiety (*n* = 56 participants). Results of the chi-square analysis between anxiety and completion of colorectal cancer screening are presented in Table 6.

Table 6

Chi-Square Analysis for Anxiety and Completion of Colorectal Cancer Screening

| Anxiety | Completion of Colorectal Cancer Screening | | $\chi^2(1)$ | *p* |
	Yes	No		
Yes	9 [17.3]	24 [15.7]	11.40	.001
No	56 [47.7]	35 [43.3]		

Note: Bracketed values display expected counts for each cell**Research Question 2:** What is the relationship between transportation, physical ability to do testing, understanding the preparation for testing, and completion of colorectal cancer screening?

H02: There is no relationship between transportation, physical ability to do testing, understanding the preparation for testing, and completion of colorectal cancer screening?

HA2: There is a relationship between transportation, physical ability to do testing, understanding the preparation for testing, and completion of colorectal cancer screening?

To address research question two, a series of chi-square analyses were conducted to examine the relationship between transportation, physical ability to do testing, understanding the preparation for testing, and completion of colorectal cancer screening. Transportation, physical ability to do testing, understanding the preparation for testing, and completion of colorectal cancer screening were coded: 1 = yes, 0 = no.

Transportation. Results of the chi-square did not indicate significance, $\chi^2(1) =$ 0.44, *p* = .508, suggesting that there was not a significant relationship between

transportation and completion of colorectal cancer screening. Most participants had

completed colorectal cancer screening and did have access to transportation (n = 53

participants). Results of the chi-square analysis between access to transportation and

completion of colorectal cancer screening are presented in Table 7.

Table 7

Chi-Square Analysis for Transportation and Completion of Colorectal Cancer Screening

| Access to Transportation | Completion of Colorectal Cancer Screening | | $\chi^2(1)$ | p |
	Yes	No		
Yes	53	43	0.44	.508
	[51.4]	[44.6]		
No	15	16		
	[16.6]	[14.4]		

Note: Bracketed values display expected counts for each cell

Physical ability to do testing. Results of the chi-square indicated significance,

$\chi^2(1) = 5.77$, p = .016, suggesting that there was a significant relationship between having

physical ability to do testing and completion of colorectal cancer screening. Most

participants had completed colorectal cancer screening and did have a physical ability to

do testing (n = 61 participants). Results of the chi-square analysis between physical

ability to do testing and completion of colorectal cancer screening are presented in Table

8.

Table 8
Chi-Square Analysis for Physical Ability to do Testing and Completion of Colorectal Cancer Screening

| Physical Ability | Completion of Colorectal Cancer Screening | | $\chi^2(1)$ | p |
	Yes	No		
Yes	61	42	5.77	.016

	[56.1]	[46.9]
No	6	14
	[10.9]	[9.1]

Note: Bracketed values display expected counts for each cell

Understanding preparation for testing. Results of the chi-square did not indicate significance, $\chi^2(1) = 0.88$, $p = .349$, suggesting that there was not a significant relationship between understanding preparation for testing and completion of colorectal cancer screening. Most participants had completed colorectal cancer screening and did not understand test preparation ($n = 57$ participants). Results of the chi-square analysis between understanding preparation for testing and completion of colorectal cancer screening are presented in Table 9.

Table 9

Chi-Square Analysis for Understanding Preparation for Testing and Completion of Colorectal Cancer Screening

	Completion of Colorectal Cancer Screening			
Understanding Test Preparation	Yes	No	$\chi^2(1)$	p
Yes	10	12	0.88	.349
	[12.0]	[10.0]		
No	57	44		
	[55.0]	[46.0]		

Note: Bracketed values display expected counts for each cell

Research Question 3: What is the relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

H03: There is no relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

HA3: There is a relationship between demographics (education, age, gender, race) and completion of colorectal cancer screening?

To address research question three, a series of chi-square analyses and a point-biserial correlation were conducted to examine the relationship between education, age, gender, race, and completion of colorectal cancer screening. A point-biserial correlation is an appropriate statistical analysis when assessing the strength of association between a continuous variable and a dichotomous variable (Pagano, 2009). Education was a categorical variable coded: 1 = GED, 2 = Diploma, 3 = some college, 4 = Bachelors, 5 = No response. Age was treated as a continuous variable. Gender was a dichotomous variable coded: 1 = male, 0 = female. Race was a categorical variable coded: 1 = Black, 2 = White, 3 = Other. Completion of colorectal cancer screening was coded: 1 = yes, 0 = no.

Education. Results of the chi-square did not indicate significance, $\chi^2(4) = 3.94$, $p = .415$, suggesting that there was not a significant relationship between education and completion of colorectal cancer screening. Most participants had completed colorectal cancer screening and had obtained a diploma ($n = 35$ participants). Results of the chi-square analysis between education and completion of colorectal cancer screening are presented in Table 10.

Table 10

Chi-Square Analysis for Education and Completion of Colorectal Cancer Screening

	Completion of Colorectal Cancer Screening			
Education	Yes	No	$\chi^2(4)$	*p*
GED	15	9	3.94	.415

	[13.0]	[11.0]
Diploma	35	31
	[35.9]	[30.1]
Some college	2	0
	[1.1]	[0.9]
Bachelors	1	0
	[0.5]	[0.5]
No response	16	18
	[18.5]	[15.5]

Note: Bracketed values display expected counts for each cell

Gender. Results of the chi-square did not indicate significance, $\chi^2(1) = 1.30$, $p = .254$, suggesting that there was not a significant relationship between gender and completion of colorectal cancer screening. Most participants who had completed the colorectal cancer screening were female ($n = 53$ participants). Results of the chi-square analysis between gender and completion of colorectal cancer screening are presented in Table 11.

Table 11

Chi-Square Analysis for Gender and Completion of Colorectal Cancer Screening

| | Completion of Colorectal Cancer Screening | | | |
Gender	Yes	No	$\chi^2(1)$	p
Female	53	40	1.30	.254
	[50.1]	[42.9]		
Male	16	19		
	[18.9]	[16.1]		

Note: Bracketed values display expected counts for each cell

Race. Results of the chi-square did not indicate significance, $\chi^2(2) = 1.17$, $p = .559$, suggesting that there was not a significant relationship between race and completion of colorectal cancer screening. Most participants who had completed colorectal cancer screening were African American ($n = 56$). Results of the chi-square analysis between race and completion of colorectal cancer screening are presented in Table 12.

Table 12

Chi-Square Analysis for Race and Completion of Colorectal Cancer Screening

	Completion of Colorectal Cancer Screening			
Race	Yes	No	$\chi^2(2)$	*p*
Black	56	49	1.17	.559
	[55.2]	[49.8]		
White	6	6		
	[6.3]	[5.7]		
Other	0	51		
	[0.5]	[0.5]		

Note: Bracketed values display expected counts for each cell

Age. A point-biserial correlation was conducted to examine the relationship between age and completion of colorectal cancer screening. Results of the correlation did not indicate significance, r_{pb} = -.15, *p* = .086. Thus, there is not sufficient evidence for a statistically significant relationship between age and completion of colorectal cancer screening. Results of the point-biserial correlation are presented in Table 13.

Table 13

Point-Biserial Correlation between Age and Completion of Colorectal Cancer Screening

	Completion of Colorectal Cancer Screening
Age	-.15

Note. * *p* < .05. ** *p* < .01.

Research Question 4: What is the relationship, between being aware of recommended colorectal cancer screening at age 50 and completing the test?

> **H04:** There is no relationship between being aware of recommended colorectal cancer screening at age 50 and completion of the test?

> **HA4:** There is no relationship between being aware of recommended colorectal cancer screening at age 50 and completion of the test?

To address research question four, a chi-square analysis was conducted to examine the significant relationship between being aware of the recommended colorectal cancer screening at age 50 and completion of colorectal cancer screening. Awareness of screening at age 50 was coded: 1 = yes and 0 = no. Completion of colorectal cancer screening were coded: 1 = yes, 0 = no.

Awareness of screening at age 50. Results of the chi-square did not indicate significance, $\chi^2(1) = 6.75$, $p = .009$, suggesting that there was a significant relationship between awareness of screening at age 50 and completion of colorectal cancer screening. Most participants had completed colorectal cancer screening and were aware of screening at age 50 ($n = 58$ participants). Results of the chi-square analysis between awareness of

screening at age 50 and completion of colorectal cancer screening are presented in Table

14.

Table 14

*Chi-Square Analysis for Awareness of Screening at Age 50 and Completion of Colorectal
Cancer Screening*

	Completion of Colorectal Cancer Screening			
Awareness of Screening at Age 50	Yes	No	$\chi^2(1)$	p
Yes	58 [51.8]	38 [44.2]	6.75	.009
No	10 [16.2]	20 [13.8]		

Note: Bracketed values display expected counts for each cell

Research Question 5: What is the relationship, between FOBT vs Scope procedures, age

of first screening, and completion of colorectal cancer screening?

H$_0$5: There is no relationship between FOBT vs Scope procedures, age of first

screening, and completion of colorectal cancer screening?

H$_A$5: There is a relationship between, FOBT vs Scope procedures, age of first

screening, and completion of colorectal cancer screening?

To address research question five, a series of chi-square analyses were conducted

to examine the relationship between FOBT vs Scope procedures, age of first screening,

and completion of colorectal cancer screening. FOBT vs Scope procedures were coded: 1

= FOBT and 2 = SCOPE. Age of first screening and completion of colorectal cancer

screening were coded: 1 = yes, 0 = no.

FOBT vs scope procedure. Results of the chi-square did indicate significance, $\chi^2(1) = 14.71$, $p < .001$, suggesting that there was a significant relationship between FOBT vs Scope and completion of colorectal cancer screening. Most participants had completed colorectal cancer screening and used the Scope procedure ($n = 42$ participants). Results of the chi-square analysis between FOBT vs Scope and completion of colorectal cancer screening are presented in Table 15.

Table 15

Chi-Square Analysis for FOBT vs Scope and Completion of Colorectal Cancer Screening

	Completion of Colorectal Cancer Screening			
Procedure Used	Yes	No	$\chi^2(1)$	p
FOBT	17	35	14.71	<.001
	[27.2]	[24.8]		
Scope	42	19		
	[31.8]	[29.2]		

Note: Bracketed values display expected counts for each cell

Age of first screening. Results of the chi-square indicate significance, $\chi^2(1) = 18.49$, $p < .001$, suggesting that there was a significant relationship between age of first screening and completion of colorectal cancer screening. Most participants who had completed colorectal cancer screening had been screened at age 50 ($n = 37$ participants). Results of the chi-square analysis between age of first screening and completion of colorectal cancer screening are presented in Table 16.

Table 16

Chi-Square Analysis for Age of First Screening and Completion of Colorectal Cancer Screening

| Screen at Age 50? | Completion of Colorectal Cancer Screening | | $\chi^2(1)$ | *p* |
	Yes	No		
Yes	37 [25.4]	10 [21.6]	18.49	<.001
No	31 [42.6]	48 [36.4]		

Note: Bracketed values display expected counts for each cell

Research Question 6: What is the relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer, and completion of colorectal cancer screening?

> **H06:** There is no relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer and completion of colorectal cancer screening.

> **HA6:** There is a relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer and completion of colorectal cancer screening

To address research question six, a series of chi-square analyses were conducted to examine the relationship between who recommended colorectal cancer screening, being told to get screened, symptoms of cancer, knowing someone who had colorectal cancer, and completion of colorectal cancer screening. The variable for who recommended colorectal cancer screening was coded: 1 = family, 2 = medical person, 3 = multiple people, 4 = newspaper/TV, 5 = Other. Being told to get screened, symptoms of

cancer, knowing someone who had colorectal cancer, and completion of colorectal cancer screening were coded: 1 = yes, 0 = no.

Individual(s) who recommended screening. Results of the chi-square did not indicate significance, $\chi^2(4) = 2.16$, $p = .706$, suggesting that there was not a significant relationship between who recommended cancer screening and actual completion of colorectal cancer screening. Most participants who had completed colorectal cancer screening were recommended for the screening by a medical person ($n = 43$ participants). Results of the chi-square analysis between individual(s) who recommended screening and completion of colorectal cancer screening are presented in Table 17.

Table 17

Chi-Square Analysis for who Recommended Screening and Completion of Colorectal Cancer Screening

| Who Recommended Screening | Completion of Colorectal Cancer Screening | | $\chi^2(4)$ | p |
	Yes	No		
Family/friend	8	8	2.16	.706
	[8.7]	[7.3]		
Medical person	43	30		
	[39.6]	[33.4]		
Multiple people	5	5		
	[5.4]	[4.6]		
Newspaper/tv	2	2		
	[2.2]	[1.8]		
Other	5	8		
	[7.1]	[5.9]		

Note: Bracketed values display expected counts for each cell

Being told to get screened. Results of the chi-square did indicate significance, $\chi^2(1) = 39.00$, $p < .001$, suggesting that there was a significant relationship between being

told to get screened and completion of colorectal cancer screening. Most participants who were told to be screened, actually completed the colorectal cancer screening process (n = 67 participants). Results of the chi-square analysis between being told to get screened and completion of colorectal cancer screening are presented in Table 18.

Table 18

Chi-Square Analysis for Being Told to Get Screened and Completion of Colorectal Cancer Screening

Being Told to Get Screened	Completion of Colorectal Cancer Screening		$\chi^2(1)$	p
	Yes	No		
Yes	67	29	39.00	<.001
	[51.8]	[44.3]		
No	2	30		
	[17.3]	[14.8]		

Note: Bracketed values display expected counts for each cell

Know someone who had colorectal cancer. Results of the chi-square indicated significance, $\chi^2(1) = 4.13$, $p = .042$, suggesting that there was a significant relationship between knowing someone who had colorectal cancer and completion of colorectal cancer screening. Most participants who had completed colorectal cancer screening did not know someone who had colorectal cancer (n = 43 participants). Results of the chi-square analysis between knowing someone who had colorectal cancer and completion of colorectal cancer screening are presented in Table 19.

Table 19

Chi-Square Analysis for Knowing Someone Who Had Colorectal Cancer and Completion of Colorectal Cancer Screening

Know Someone Who Had Colorectal Cancer	Completion of Colorectal Cancer Screening		$\chi^2(1)$	p
	Yes	No		
Yes	23	11	4.13	.042
	[18.0]	[16.0]		
No	43	48		
	[48.0]	[43.0]		

Note: Bracketed values display expected counts for each cell

Binary Logistic Regression

A binary logistic regression was conducted to examine the predictive relationship between the significant predictors from the chi-square analyses and completion of colorectal cancer screening. A binary logistic regression is an appropriate statistical analysis when the goal of the research is to assess the predictive association between a group of predictors and a dichotomous dependent variable (Stevens, 2009). The significant predictors entered into the model corresponded to embarrassment, fear of pain, fear of cancer, anxiety, physical ability to do testing, awareness of screening at age 50, FOBT vs Scope procedures, age of first screening, being told to get screening, and knowing someone who had screening. The outcome variable corresponded to completion of colorectal cancer screening – Yes or No.

Prior to analysis, the assumptions of a binary logistic regression were assessed – outliers, absence of multicollinearity, and independence of errors (Tabachnick & Fidell, 2013). Due to the variables of interest all being dichotomous, there were no outliers to

identify and the assumption was met. Variance Inflation Factors (VIFs) were used to test

the absence of multicollinearity assumption, where values greater than 10 suggested a

violation of the assumption (Stevens, 2009). None of the VIF values in the regression

model were greater than 10 (largest VIF = 1.96), therefore, the assumption was met.

Table 20 presents the findings of the Variance Inflation Factors (VIFs). The

independence of errors assumption was met due to every participant providing

independent responses. Each response derived from a different, unrelated case.

Table 20

VIF Values for Variables Entered into Logistic Regression

Variable	*VIF*
Embarrassment	1.34
Fear of pain	1.68
Fear of cancer	1.73
Anxiety	1.96
Physically able to test	1.49
Awareness of screening at age 50	1.19
FOBT vs Scope	1.14
Age of first screening at age 50	1.32
Being told to get screening	1.20
Know someone with colorectal cancer	1.12

Results of the binary logistic regression indicated that there was a significant

association between embarrassment, fear of pain, fear of cancer, anxiety, physical ability

to do testing, awareness of screening at age 50, FOBT vs Scope procedures, age of first

screening, being told to get screening, knowing someone who had screening, and

completion of colorectal cancer screening ($\chi^2(10) = 69.22, p < .001$). The predictors in the model collectively accounted for 64.5% of the variance in completing colorectal cancer screening.

Participants who indicated they were anxious had 8.33 (1/0.12) more odds to not have completed colorectal cancer screening in comparison to participants who indicated they were not anxious (Wald (1) = 4.31, p = .038). Participants who used the Scope method had 5.17 more odds to have completed colorectal cancer screening in comparison to participants who used the FOBT method (Wald (1) = 6.73, p = .009). Participants who were told to get screening had 59.84 times more odds to have completed colorectal cancer screening in comparison to participants who were not told to get screened (Wald (1) = 12.68, p < .001). Results of the binary logistic regression are presented in Table 21.

Table 21

Results of the Binary Logistic Regression for Significant Variables and Completion of Colorectal Cancer Screening

Source	*B*	Wald (1)	*p*	*OR*	95% CI for *OR* Lower	Upper
Embarrassment	-0.21	0.03	.858	0.81	0.08	8.16
Fear of pain	0.43	0.23	.631	1.54	0.26	9.01
Fear of cancer	0.79	0.55	.457	2.21	0.27	17.79
Anxiety	-2.10	4.31	.038	0.12	0.02	0.89
Physically able to test	1.59	2.67	.103	4.88	0.73	32.77
Awareness of screening at age 50	0.39	0.31	.580	1.48	0.37	5.93
FOBT vs Scope	1.64	6.73	.009	5.17	0.06	0.67
Age of first screening at age 50	1.37	3.45	.063	3.95	0.93	16.81
Being told to get screening	4.09	12.68	<.001	59.84	6.29	568.96
Know someone with colorectal cancer	-0.15	0.04	.837	0.86	0.20	3.71

Note. Overall model fit: $\chi^2(10) = 69.22, p < .001$, Nagelkerke $R^2 = .645$

Summary

The purpose of the proposed research was to determine which variables might influence colorectal cancer screening completion, in people with persistent and severe mental illness, who receive services from a CMH agency. This chapter presented the findings of the data collection and data analyses. Demographic characteristics and descriptive statistics were presented first.

To examine the research questions, a series of chi-square analyses were conducted to examine the cross tabulations between the categorical characteristics of participants and completion of colorectal cancer screening. The significant chi-square analyses of variables correlated with completion of colorectal cancer screening corresponded to embarrassment, fear of pain, fear of cancer, anxiety, physical ability to do testing, awareness of screening at age 50, FOBT vs Scope procedures, age of first screening, being told to get screening, and knowing someone who had screening. The non-significant chi-square analyses of variables uncorrelated with completion of colorectal cancer screening corresponded to transportation, understanding preparation for testing, education, gender, race, and the individual who recommended screening. A point-biserial correlation was conducted to examine the relationship between age and completion of colorectal cancer screening. The correlation was not significant, suggesting that there was not a significant relationship between age and completion of colorectal cancer screening.

The significant variables from the chi-square analyses were entered into a binary logistic regression. The overall model was significant, suggesting that 64.5% of the variance in completion of colorectal cancer screening could be attributed to the

predictors. The significant predictors in the model corresponded to Anxiety, FOBT vs Scope, and being told to get screening. Participants who indicated they were anxious were less likely to have completed colorectal cancer screening when compared to participants who indicated they were not anxious. Participants who used the Scope method were more likely to have completed colorectal cancer screening when compared to participants who used the FOBT method. Participants who were told to get screening were more likely to have completed colorectal cancer screening when compared to participants who were not told to get screened.

In the next chapter, the statistical findings will be discussed further and comparisons will be made to existing literature. The findings will be also connected back to the theoretical framework selected for the research. Additionally, limitations and suggestions for future research will be discussed as well.

Chapter 5: Discussion, Conclusions, and Recommendations

Colorectal cancer is the second leading cause of cancer deaths behind lung cancer. (Centers for Disease Control, 2011) About 1 in 20 people have a lifetime risk of being diagnosed with colorectal cancer, causing an estimated 49,700 deaths in 2015 (American Cancer Society, 2015). Although rates of colorectal cancer detection are increasing as more and more people get preventative screenings, one population that does not show a decrease are people with mental illness. An estimated 46.4% of Americans experience mental illness in their lifetime; persons with chronic mental illness on average live 15-20 fewer years than people without mental illness (Kessler et al., 2005; Wahlbeck, Westmann, Nordentoft, & Gissler, 2011). In addition to a shorter life span, the incidence of cancer in people with mental illness is 2.5 times that of the general public and, in men younger than 50 years, 6.6 times the risk than that of the general public (Pandiani, Boyd, Bank, & Johnson, 2006). Individuals with mental illness diagnosed with cancer die an average of 10 years earlier than those without mental illnesses (Musuuzo et al., 2013). Persons over 65 years of age with mental disorders are also more likely to be diagnosed with colon cancer only at autopsy, with an unknown stage of cancer, and without having received any treatment (Baillargeon et al., 2011).

By finding variables that increase the likelihood of colorectal cancer screening completion, community mental health (CMH) agencies can devise ways to remedy lack of colorectal cancer screening that might also increase screenings for other types of cancer/illnesses in this population group. Despite an extensive literature search, I did not find any studies that specifically addressed variables affecting colorectal cancer screening

completion in the CMH population. Thus, the purpose of this quantitative correlational survey design study was to identify variables that affect the probability of completion of colorectal cancer screening, whether through FOBT/FIT (stool sample) or sigmoid/colonoscopy (scope) by people with mental illness who obtain mental health care from a CMH agency.

The results of the correlational analyses showed that several variables were significantly related to screening: embarrassment, fear of pain, fear of cancer, anxiety, being physically able to complete the test/preparation, awareness of screening at age 50, FOBT/FIT vs Scope, age of first screening at 50, being told to get screening, and knowing someone with colorectal cancer. Together, these factors, according to a binary logistic regression, created a significant model for predicting completion of colorectal cancer screening. However, only three of the variables were individually significant predictors: anxiety, FOBT/FIT vs scope, and being told to get screening. In this chapter, I provide further discussion of these findings, including interpretation, limitations, recommendations, and implications.

Interpretation of the Findings

I conducted individual chi-square tests to examine the correlation between each survey item and the completion of colorectal cancer screening. The variables in the chi-square tests that were significantly related to screening were embarrassment, fear of pain, fear of cancer, anxiety, being physically able to complete the test/preparation, awareness of screening at age 50, FOBT vs Scope, age of first screening at 50, being told to get screening, and knowing someone with colorectal cancer were significantly related to

screening. Only these variables were entered into the binary logistic regression. In the binary logistic regression model, the overall model was significant in that 64.5% of the variance of screening are due to predictors suggesting that all of these variables collectively have an impact on completion of colorectal cancer screening.

The significant individual predictors in the model corresponded to anxiety, FOBT/FIT vs scope, and being told to get screening. Specifically, participants who indicated they were anxious were more likely to not have completed colorectal cancer screening when compared to participants who indicated they were not anxious. Participants who used the scope method were more likely to have completed colorectal cancer screening when compared to participants who used the FOBT method. Participants who were told to get screening were more likely to have completed colorectal cancer screening when compared to participants who were not told to get screened. There was no relationship between gender, race, education, age, transportation, understanding the preparation and completion of colorectal cancer screening. In the following subsections, I outline the relationship of these findings to the extant literature, as well as with relation to the theoretical framework chosen for the study.

Relationship Between Findings and Extant Literature

An extensive review of the literature revealed no existing studies examining colorectal cancer screening variables among the mentally ill who obtain services from a CMH agency. However, the existing literature revealed some findings that were primarily consistent with some of the factors that contributed to the significant model

found through the chi-square analysis. The following section outlines these factors and the related literature, as well as this study's contributions to the literature.

The findings that fear of cancer and knowing someone with colorectal cancer contributed to predicting colorectal cancer screening were inconsistent with the literature. Meissner et al. (2012) assessed perceptions of primary care providers regarding individuals' failure to receive colorectal cancer screening. One of the identified factors was that patients did not perceive themselves as susceptible to colorectal cancer (Meissner et al., 2012). Additionally, Almadi et al. (2015) determined that fear of unwanted outcomes contributed to individuals not seeking out colorectal cancer screening in Saudi Arabia, and Sohler et al. (2015) determined that knowledge did not contribute to colorectal cancer screening completion. Almadi et al.'s, Meissner et al.'s, and Sohler et al.'s studies consisted of individuals without mental illnesses, which may explain why the findings related to fear and knowledge of colorectal cancer did not align with the findings in this study. Fear of cancer is consistent with believing that one is susceptible to cancer, and knowing someone with cancer likely increases the reality of colorectal cancer and personal susceptibility; therefore, it is inconsistent that these individuals would not be more likely to seek out screening. The findings were, however, consistent with Ghobadi et al.'s (2016) findings among the general population in Iran that increasing patients' perceptions of the benefits of colorectal cancer screening increased receipt of FOBT screening.

The finding that demographics did not influence colorectal cancer screening completion was also inconsistent with the limited previous literature. Almadi et al. (2015)

and Meissner et al. (2012) noted that primary care physicians identified not being able to pay for the treatment as having a relationship with decreased receipt of screening services. In contrast, socioeconomic status did not contribute to the model predicting colorectal screening completion in this study. This lack of awareness of key factors predicting screening completion may highlight the incongruity between primary care providers and those with mental illnesses, as well as the stigma associated with this population among healthcare providers (Howard et al., 2010). An alternate interpretation is that the sample was too homogenous with respect to socioeconomic status, with all individuals at or below the poverty line; therefore, the results cannot be generalized to a broader sample.

Another potential inconsistency with the literature was the increased likelihood of receiving screening using the scope method. As discussed in Chapter 2, the scope method requires patients to undergo significant preparation prior to receiving treatment (American Cancer Society, 2014). Some researchers proposed that the FOBT/FIT would therefore encourage more people to receive screening, since it requires less extensive preparation and increased patient self-efficacy (Bandi et al., 2011; Ghobadi et al., 2016; Glanz et al., 2015).

Leard et al. (1997) emphasized the importance of knowing and adhering to patients' preferences regarding colorectal cancer screening, and Ghobadi et al. (2016) noted that reducing perceived barriers to screening was a contributing predictive factor of colorectal cancer screening. Complicating this recommendation, the type of screening preferred was the FOBT/FIT; however, more people completed the colonoscopy. As a

result, this finding is significant for understanding colorectal cancer screening among those with mental illnesses. A potential interpretation of this finding is that since preparation for a scope test (adhering to a liquid diet the day before the test, drinking poor tasting fluids in order to clear the bowels which results in diarrhea, and needing someone to take the person to the test and home again) involve things that a patient may feel more comfortable personally completing than collecting and providing a stool sample, as required through the FOBT/FIT. This may relate to Ghobadi et al.'s finding that increasing patient self-efficacy contributed to receipt of colorectal cancer screening. In addition, in the general population, about 25% of colonoscopies fail due to poor preparation/clearing of the bowels (Hand, 2014). However, since fear of pain was also negatively related to colorectal cancer screening and a scope is more painful, researchers should further investigate these factors and how they interrelate with colorectal cancer screening completion.

Several other findings of the present study were consistent with the extant literature. For example, Ferrante et al. (2013) determined that increased visits to primary care providers led to increased colorectal cancer screening among the general population. Similarly, within populations without mental illnesses, Almadi et al. (2015) determined that access to health care delivery systems contributed to colorectal cancer screening, and Sohler et al. (2015) noted discussions with a care provider increased colorectal cancer screening.

Increased visits could also explain increased awareness of the need for screening at 50, adherence to screening at 50, and being told to get screening, factors that the

present study linked with colorectal cancer screening completion. In addition, Friedman et al. (2005) determined that among the mentally ill, medical providers recommendations were essential to cancer screening completion. The increased contact and comfort with a primary care provider could also explain a lessened feeling of embarrassment and shame, which this study and Almadi et al. found contributed to likelihood to complete colorectal cancer screening.

One complication of the consistency of these findings with the literature is that problems between primary care providers and those with mental illnesses may exacerbate the lack of colorectal cancer screening services among the mentally ill. The previously published literature was conducted among general populations (e.g., Almadi et al., 2015; Meissner et al., 2012). In general, those with mental illnesses receive preventative services at a lower rate than the general population (Drus et al., 2002). Issues such as diagnostic/treatment overshadowing may contribute to primary care providers failing to recommend appropriate treatment (Howard et al., 2010). As such, the mentally ill may be less likely to receive the necessary information, assistance, and recommendations to receive colorectal cancer screening. This is particularly important since being told to get screening was an individual predictor of colorectal cancer screening completion.

Relationship Between Findings and Theoretical Framework

The research was conducted using a survey with a basis upon the HBM, as well as demographic information. Theorists of the HBM posit that the belief in a personal threat, together with the belief in the effectiveness of the proposed behavior, will predict the likelihood of patients' behaviors (Rosenstock et al., 1988). Although the survey included

demographics and the role they play on completion of colorectal cancer screening, age, gender, race, education, and insurance status did not play a role in completion of colorectal cancer screening. Only factors related to perceived threats/barriers/susceptibility, cues to action, and self-efficacy, as present in the HBM, had a significant predictive relationship with colorectal cancer screening completion (Glanz et al., 2015). The results of the present study were partially consistent with these broad categories, as discussed below.

Perceived threats, barriers, and susceptibility. This research attempted to identify whether or not the following barriers to colorectal cancer screening were relevant: embarrassment, fear of pain, fear of cancer, anxiety, and method of screening. These variables were in line with the theoretical literature related to the HBM (e.g., Conner & Norman, 1996; Glanz et al., 2015; Rosenstock et al., 1988). In line with the HBM, collectively all of these variables were significant predictors of screening. Thus, the current findings suggested that the HBM's explanation of perceived threats, barriers, and susceptibility is an adequate framework for understanding factors that predict colorectal cancer screening completion by individuals in this sample.

Individually, only anxiety and completion of scope over FOBT/FIT were noteworthy. Individuals who indicated anxiety about screening were 8.33 times less likely to have it done. Therefore, the findings suggest anxiety about colorectal cancer screening is a significant perceived barrier that may impede colorectal cancer screening completion among those with mental illnesses.

Similarly, although participants reported that they preferred the FOBT/FIT, they were more likely to complete the scope test. The preference for FOBT/FIT is consistent with the HBM, inasmuch as providing a stool sample requires less preparation than the scope (American Cancer Society, 2014). However, the findings indicated that the actual preparation work is not a barrier to completion with the scope test. A potential interpretation of these findings is that the preparation for the scope test involves factors that individuals feel more comfortable controlling (e.g. diet changes and transportation), thereby increasing self-efficacy. On the other hand, the FOBT/FIT requires that the individual provide a stool sample, which may be uncomfortable and therefore increase the likelihood that the person will not complete the screening (Glanz et al., 2015).

Cues to action. Per the HBM, suspected cues to action evaluated were being told to get the screening and knowing someone who had colorectal cancer. Knowing someone who had colorectal cancer also increased testing completion at a minimally significant rate. Moreover, having a medical provider recommend screening increased success by 59.84% for completion of colorectal screening; therefore, provider recommendation was an individual predictor of completion. Thus, the cues to action portion of the HBM were consistent with the results of the present study (Glanz et al., 2015).

Self-efficacy. Suspected self-efficacy variables such as transportation, physical ability to complete screening, and being able to understand the procedure preparation were evaluated for this study. With regards to self-efficacy, only physical ability to complete the test contributed to the overall model that predicted screening completion in this population. Conversely, transportation and understanding of the preparation did not

play a role in completion of screening, inconsistent with the HBM (Glanz et al., 2015; Rosenstock et al., 1988) and previous research (Almadi et al., 2015; Sohler et al., 2015). This finding was inconsistent with Gholbadi et al.'s (2016) and Sohler et al.'s (2015) findings, which found a *p* value of less than .01 between self-efficacy and colorectal cancer screening within a sample of the general population. These findings suggested that self-efficacy plays less of a direct role than do cues to action and perceived threats and barriers to completion within those with mental illnesses. As previously mentioned, it may be fruitful to examine self-efficacy further with relation to the increased rate of scope completion when compared to FOBT/FIT in addition to whether or not the person was given a choice by the medical provider.

Limitations of the Study

There are several limitations to this study that were identified prior to the completion of its research. These limitations may be useful for guiding follow-up research. The limitations are as follows:

Mental Illness Diagnosis

Because many people do not know their exact diagnoses, I did not ask about specific mental illnesses in my survey instrument. For example, a patient might indicate that he or she has *bipolar illness* when, as the Diagnostic and Statistical Manual V indicates, it is currently referred to as *bipolar depression*, which is a different diagnosis. A patient might say that he or she has *schizophrenia* when the real diagnosis according to the Diagnostic and Statistical Manual V indicates that the person has *schizoaffective disorder*, which is similarly very different from schizophrenia. There was no way to

confirm correct diagnosis in this population group through a self-reporting anonymous survey; therefore, it was omitted. However, specific mental illnesses have different presentations that may have influenced the outcomes of the study, if considered.

Mental Illness With Substance Abuse

Co-occurring diagnosis confirmation of a substance abuse was also not considered in this study. One would have to identify each type of substance abuse (e.g., cocaine, heroin, alcohol, or combination) to determine the role that this plays in completion of colorectal cancer screening. The particular type of substance abuse, if identified, may have been a demographic variable that influenced the results.

Sample and Generalizability

The present study also had limitations with respect to the sample. Use of a convenience sampling procedure led to my inability to control variables and diversity with respect to demographic factors. The location of this study was also limited to the inner city of Detroit, as opposed to a more rural area, or to a more diverse sample of multiple locations. The agencies are in crime ridden areas; particularly one of the centers that has a high poverty/crime rate and is known on the streets as "car jack city."

In addition, the majority of the clients who participated in the study identified as black. This might be a limitation because people with darker skin have a higher rate of colorectal cancer, and medical providers often recommend colorectal cancer screening at age 45 for people with very dark skin. However, race was not a significant variable according to the present study.

All of the participants were at poverty level, and most had Medicaid insurance; individuals with mental illnesses at a higher socioeconomic level could be more likely to complete colorectal cancer screening. It would be interesting to study only individuals with Medicare and their colorectal cancer screening rates. A larger, more diverse sample could increase the generalizability of the results.

Transportation

A specific limitation with respect to the study sample is the lack of influence of transportation on colorectal cancer screening completion. Transportation in the study was not a barrier to colorectal cancer screening. However, at the CMH studied, most of the Medicaid providers have free transportation services provided by the insurance company. It might be helpful to further study the use of transportation such as free services, Medicare vs. Medicaid, GI office-provided transportation for those without a loved one to transport and stay with him or her during a procedure, and other variables related to transportation in particular. In addition, at more rural locations, transportation might be less readily available, and therefore become an influential factor.

Instrument

A final limitation was the measurement bias of the instrument. I did no psychometric testing of my instrument. Therefore, the instrument was a potential limitation of the study.

<div align="center">

Recommendations

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There was a lack of research investigating colorectal cancer screening variables among those with mental illnesses. This lacking focus represented a general malaise with

respect to the mentally ill regarding basic primary care (Howard et al., 2010). The primary recommendation for research and practice is to combat this apathy by sparking a focus on preventive care and services for those with mental illnesses, specifically with relation to colorectal cancer. Several additional recommendations for researchers and for clinical practice stem from this overarching recommendation.

Recommendations for Future Researchers

Additional research is needed regarding colorectal cancer screening among those with mental illnesses. This population is disproportionally affected by colorectal cancer, inasmuch as mortality is greater and diagnoses are lesser (Baillargeon et al., 2011; Kold et al., 2010). For example, researchers should determine whether and how fear of pain interrelates with the preference for the scope test demonstrated in the present study, and how this relationship affects colorectal cancer screening among those with mental illness.

The present study determined that the HBM, especially cues to action and perceived barriers, threats, and susceptibility, was an adequate method of determining variables that influenced colorectal cancer screening completion among those with mental illnesses in this sample. Further researchers could use the HBM in similar studies to assess HBM variables which contribute to completion of other preventive healthcare by those with mental illnesses, including mammogram/pap tests, ophthalmology exams (in people with diabetes), optometry, dental care, routine physical exams, and bone density scans to name a few. Alternatively, researchers could also examine colorectal cancer screening through the theoretical frameworks of the modified HBM, in light of recent findings regarding the hierarchical nature and influence of the HBM (e.g., Jones et

al., 2015) or the theory of planned behavior, which may be more effective in explaining health care seeking behaviors than the HBM, as found by Gerend and Shepherd (2012).

Some recommendations for future researchers result from the limitations of the present study. For example, CMH agencies are located in high socioeconomic cities as well as rural areas with low crime rates with various ethnic and racial distributions; therefore, future researchers should consider conducting a similar study in a different location. Researchers could consider including participants from several different sites in the United States. This additional research would help determine the generalizability of the HBM variables identified in the present study, as well as reduce the limitations with respect to the homogeneity of this study's sample. This change could have implications for the results regarding demographics and transportation. Utilization of the Multi-theory Model (MTM) might also be used in helping to explain and predict health behaviors (Nahar, Sharma, Catalano, Ickes, Johnson, & Ford, 2016).

Conducting the proposed research led to several recommended changes to the present study parameters. I recommend that a person be assigned to ask the questions to make sure that the participant understands what is being asked due to cognitive impairment common with mental illnesses as well as various educational levels of participants. This change could influence the outcomes of future studies. Future studies may also consider an alternative sampling method. People who came to the CMH for appointments became subjects upon completion of the voluntary questionnaire used in this study. Future researchers might want to assess which patients age 45 and older in order to find out who completed colorectal cancer screening, if it was recommended, and

why it was or was not completed. This might increase the sample size, allow for more accurate responses (someone explaining questions asked by phone or in person if there was any confusion), and increase knowledge related to variables that affect colorectal cancer screening completion.

I also recommend that future researchers conduct studies of the Registered Nurse Assessment to determine if it is done on all patients yearly, if it includes recommendations for preventative screenings, how the information is conveyed to the patient/medical provider/treatment team, how it is monitored for completion, and if patient education is provided.

Since recommendations from care providers were a significant predictor of screening completion, future researchers could consider this factor and variables that increased screening completion, such as computerization, clarity of recommendation, recommendations specific to race, family history, and age of person in relation to colorectal cancer screening. In addition, it may be relevant whether the RN educates the patient on various types of colorectal cancer screening, as well as assesses for anxiety, fear of testing, and ability to complete the preparation for the screening. Follow up on lapses in preventative screenings may also influence completion. The results of these studies could further inform implications for clinical practice beyond the parameters of this study.

Implications

General

The findings have implications at the clinical level. Results suggested that several variables related to the HBM influenced the completion of colorectal cancer screening among those with mental illnesses in a CMH agency: embarrassment, fear of pain, fear of cancer, anxiety, being physically able to complete the test/preparation, awareness of screening at age 50, FOBT/FIT vs scope, age of first screening at 50, being told to get screening, and knowing someone with colorectal cancer. Individual predictors, such as anxiety, FOBT/FIT vs scope, and being told to get screening, require specific attention from practitioners. Knowledge and awareness that these factors influenced decision making among this population would lead to some transformations in care, including the integration of the CMH agency into the colorectal cancer screening process.

Firstly, an RN could conduct yearly Nursing Assessments on all CMH patients, which would include preventative health care with recommendations made to the primary care provider, patients, and case manager. These recommendations would also appear in the Person Centered Plan. All clients of the CMH develop a Person Centered Plan, which includes goals and ways to achieve them. Staff members usually help with a mandated "health and safety" section, which might include getting a physical exam yearly or seeing a dentist every six months. If an RN was part of the Person Centered Planning, then goals for preventative health care could be included in that goal. The goal might be for the person to ask his or her medical provider for colorectal cancer screening, rather than waiting for a recommendation. The RN could use this as a teaching opportunity to help

dispel fears of cancer/embarrassment/anxiety and educate the person on screening options.

For colorectal cancer specifically, the RN could recommend the screening and assess need for screening earlier than 50 if there was a family history or symptoms present. Then, the RN can incorporate the need for this screening into the person's physical health goal in the treatment plan. A case manager or other staff involved with implementation of the Person Centered Plan would monitor whether or not the person's medical provider provided a prescription for a colonoscopy or stool sample testing, and assess the patient's feelings about and understanding of the test and its preparation. For anxiety in particular, the RN could answer any questions and dispel any myths that the person might have about getting colorectal cancer screening.

If the person did not follow through, a referral back to the RN could occur for assistance with identifying variables that are preventing the screening from taking place. For example, if a person is physically unable to complete the prep for a colonoscopy ordered by a medical provider, the RN could coordinate care, which might include facilitation of a prescription for a fecal stool sample instead. The RN could also provide instructions for providing the sample, which may include a speci-pan, a collection method that makes obtaining the sample easier for those who are physically unable to complete the test, which was a barrier to completing colorectal cancer screening in this study. One key consideration would be anxiety. The RN could pay careful attention to assessing the patient's anxiety about the test, and answer any questions or concerns that the patient might have.

Another consideration could be the type of test. The present findings suggested a contradiction in the patients' perceptions of colorectal cancer screening; while participants preferred the FOBT/FIT, they were more likely to complete the scope test. Considering a patient's preference of test is essential to testing completion (Leard et al., 1997); however, medical professionals need to put more consideration into the decision-making process, including asking and receiving answers to specific questions about the preparation for both tests. For example, a medical care provider could ask:

- "Would you feel comfortable adhering to a liquid only diet?"

- "Would you be okay with taking this medicine?" and

- "Could you provide a stool sample by taking some of your poop and smearing it on this slide?"

They could also ask comparative questions, such as "Would you prefer to [do the prep for the scope test], or [the prep for the FOBT/FIT]?" When assessing this preference, medical staff should be specific and clear. Together, these questions could increase patients' comfort with completing colorectal cancer screening (Glanz et al., 2015).

Another important implication for clinical practice is the practice of increasing awareness of screenings and telling patients to receive screening. To increase care providers' and patients' awareness and therefore the likelihood that they would recommend or ask for colorectal cancer screening, a CMH could highlight a preventable illness every month, such as making March colorectal cancer screening month. The RNs could provide posters and literature on the importance of colorectal cancer screening in

the waiting room of the offices. Free literature for distribution could be obtained from local health departments and national health-related clearinghouses.

Implications for Social Change

A transformation of care so great is in line with an integrated system of care. Numerous federal, state, and local organizations recognize a lack of Integrated Healthcare between psychiatry and medical care. Newer models of care are being proposed that integrate patient-centered systems among multiple stakeholders (Pearson, 2016). To meet the goals of increasing screening, as previously mentioned, CMH agencies need to work with patients, care providers, primary care providers, and other stakeholders.

If the CMH were aware of client needs and someone was assigned to identify them and assist the person with completion of these recommendations, then disparities in death rates might change and preventative screenings might increase in this population group. The answer might be the development of a Health Advocate Team run by a Registered Nurse who develops a specific medical treatment plan that includes colorectal cancer screening recommendations and follow up. The medical goals would be discovered through a yearly Nursing Assessment. Specific preventative recommendations could be obtained by the RN through a template/computer program that includes preventative screenings, with drop down screens that appear depending upon the person's age/gender/race. Primary care providers already utilize similar software to identify when to recommend various preventative healthcare screenings. At the end of the Nursing Assessment, recommendations could be integrated into the Person Centered Plan under

Medical Care. A copy of these recommendations could be electronically forwarded (mailed or faxed) to the primary care provider and other medical providers caring for this client. This way, a reminder is on board for the Primary Care Provider that colorectal screening is recommended. Part of the communication would indicate that he or she could contact the CMH RN for further assistance with the implementation of neglected recommendations.

A Health Advocate Team run by the Registered Nurse could teach patients about FOBT/FIT and scope procedures, reduce anxiety, and reinforce the importance of screening. This team could also coordinate care with the medical provider and advocate for the patient should physical ability to complete screening via a scope method not be feasible, by assuring a prescription for the patient-preferred screening, and oversee completion of the screening. Emotional support would involve reducing embarrassment, anxiety, fear of pain, and fear of cancer. The Health Advocate Team would also teach the client ways self-navigate a complex health care system including how to keep track of appointments on a calendar, how to get transportation to medical appointments, become familiar/comfortable with medical providers. When able, the Health Advocate Team would discontinue services to the Case Management team for other non-health specific goal completion.

Such an integrated system would require extensive sharing of information, which could be achieved through information technology which might require funding for electronic medical records sharing. Because CMH agencies are rarely computer-linked to major medical centers, the ability to obtain medical information on CMH patients is often

very difficult. Even with mandated letters sent to primary care providers requesting information and, letting the provider know of CMH involvement in the person's care, information sharing is often ignored. What recommendations a primary care provider has for patients also remains a mystery to CMH staff and sometimes the patient. Some CMHs are putting a medical provider in the clinic itself. However, there is limited research as to whether or not that would increase the likelihood of preventative care recommendation and completion. It might depend upon whether or not an on-site medical provider has a computer system linked to the CMH itself in regard to information sharing with psychiatric providers. It is also unclear whether or not the CMH staff would work with the clinic's medical provider in helping clients obtain completion of colorectal or other preventative health care screenings. The development of such an integrated healthcare delivery service should be studied to show evidence based success or lack thereof.

These changes in clinical practice could have significant influences for social change. Having CMH staff help clients add specific preventative health care goals to the Person Centered Plan would ensure completion and frequent monitoring of those goals, and thereby increase colorectal cancer screening completion and decrease disparities among those with mental illnesses. It could also lead to increased screening because of an increased understanding of the different perceptions surrounding FOBT and scope procedures. Focus on HBM variables, such as telling individuals to receive screening and reducing anxiety, may increase the completion of screening, and therefore lead to prevention (Conner & Norman, 1996). The variables identified in this research could be remedied through use of the Psychiatric Registered Nurse via an Annual Nursing

Assessment that includes an evaluation for variables that might deter colorectal and other cancer preventative screenings.

In addition, social change could be effected since most CMH patients have Medicaid insurance, which is taxpayer funded. If colorectal cancer was prevented or caught early through screenings, it would be less expensive than having to pay for cancer care (chemotherapy, radiation therapy, surgery, hospitalizations, emergency room visits, and expensive medications). This can be expanded further into having CMHs ensuring that those with mental illnesses receive preventative health care.

Conclusion

When colorectal cancer is detected early, there is a high recovery rate (American Cancer Society, 2015); however, those with mental illnesses are at an increased rate of dying from lack of diagnoses from screening (Kold et al., 2010). Through this study, I identified variables that contribute to colorectal cancer completion among those with mental illnesses: anxiety, referrals to receive colorectal cancer screening, and FOBT/FIT vs scope. The implications for CMH agencies included a transformation of practice at the clinical level to consider mitigating anxiety, increasing referrals to receive screening tests, and focusing on patients' perceptions and completion of FOBT/FIT and scope procedures. With these changes to practice, the results of the study have significance for social change for the mentally ill, who will receive better screening and therefore have better outcomes if diagnosed with colorectal cancer, as well as the general community that is affected by the lack of screening within this population.

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Appendix A: Colorectal Cancer Screening Preparation

Key Instructions:
Your bowel must be empty so that your doctor can clearly view your colon. Follow all of the instructions in this handout EXACTLY as they are written.
Do NOT eat any solid food the ENTIRE day before your colonoscopy.
 Buy your bowel preparation at least 5 days before your colonoscopy. Do NOT mix the solution until the day before your colonoscopy.
A responsible family member or friend MUST come with you to your colonoscopy and REMAIN in the endoscopy area until you are discharged! You are NOT ALLOWED to drive, take a taxi or bus, or leave the Endoscopy Center ALONE. If you do not have a responsible driver (family member or friend) with you to take you home, your exam cannot be done and will be cancelled.
Some of the medicines you take may need to be stopped or adjusted before your colonoscopy. You MUST call the doctor who ordered any of the following medicines at least 2 weeks before your colonoscopy. Blood thinners -- such such as Coumadin® (warfarin), Plavix® (clopidogrel), Ticlid® (ticlopidine hydrochloride), Agrylin® (anagrelide), Xarelto® (Rivaroxaban), Pradaxa® (Dabigatran), and Effient® (Prasugrel). Insulin or diabetes pills. please call the doctor that monitors your glucose levels. Your insulin dosage may need to be adjusted due to the diet restrictions required with this bowel preparation. (Please bring your diabetes medicines with you on the day of your procedure.) If you take aspirin, take it and ALL other medications prescribed by your doctor. On the day of your colonoscopy, take your medications with a sip of water.
IMPORTANT - Please Read These Instructions at Least 2 Weeks Before Your Colonoscopy With General Anesthesia How to Prepare for Your Colonoscopy Using Prepopik Health Information For Patients and the Community Designated Driver on the Day of Your Exam Medications
 If you do NOT follow the directions for when to start drinking the bowel preparation (see next page), your colonoscopy WILL be cancelled. Revised 1/2015 1 •Do NOT take medicines that stop diarrhea -- such as Imodium®, Kaopectate®, or Pepto Bismol®. •Do NOT take fiber supplements -- such as Metamucil®, Citrucel®, or Perdiem®. •Do NOT take products that contain iron -- such as multi-vitamins -- (the label lists what is in the products). •Do NOT take vitamin E. Buy the prescription bowel preparation at your local pharmacy or drugstore pharmacy. Do NOT eat high-fiber foods -- such as popcorn, beans, seeds (flax, sunflower, quinoa), multigrain bread, nuts, salad/vegetables, or fresh and dried fruit. Only drink clear liquids the ENTIRE DAY before your colonoscopy. Do NOT eat any solid foods. Drink at least 8 ounces of clear liquids every hour after waking up. The clear liquids you can drink include: •water, apple or white grape juice; broth; coffee or tea (without milk or creamer); clear carbonated beverages such as ginger ale or lemon-lime soda; Gatorade® or other sports drinks (not red); KoolAid® or other flavored drinks (not red). You may eat plain jello or other gelatins (not red) or popsicles (not red). Do NOT drink alcohol on the day before or the day of the procedure

Step 1: At 6 PM, the day before your procedure: • Fill the dosing cup provided with cold water up to the lower (5 ounce) line on the cup. • Pour in the contents of ONE (1) packet. • Stir for 2 to 3 minutes until dissolved. • Drink the entire contents. • Drink at least FIVE (5) additional 8 oz glasses of clear liquid, taken at your own pace, within the next 5 hours.

Step 2: At 11 PM, the evening before your procedure: • Fill the dosing cup provided with cold water up to the lower (5 ounce) line on the cup. • Pour in the contents of ONE (1) packet. • Stir for 2 to 3 minutes until dissolved. • Drink the entire contents. • Drink at least THREE (3) additional 8 oz glasses of clear liquid, before midnight. You may continue to drink clear liquids only until midnight. Do NOT eat or drink ANYTHING after midnight the night before your procedure or your procedure may be cancelled. This is for your safety and will reduce the risk of having food or liquid in your stomach move into your lungs (aspiration) during a procedure. If you take aspirin, take it and ALL other prescribed medicines with a sip of water on the day of your colonoscopy.

If you are unable to keep your appointment or have any questions about the instructions, please call the facility where the procedure is being performed. Call between the hours of 8:00 AM and 5:00 PM. If you are calling after 5:00 PM, please call Nurse on Call at 216.442.0310. Contact Information Colonoscopy under general anesthesia using Prepopik Index # 15635

Cleveland Clinic Main Campus Departments of Colorectal Surgery and Gastroenterology 9500 Euclid Avenue Cleveland, OH 44195 216/444-7601

A colonoscopy is an outpatient procedure in which the inside of the large intestine (colon and rectum) is examined. A colonoscopy is commonly used to evaluate gastrointestinal symptoms, such as rectal and intestinal bleeding, abdominal pain, or changes in bowel habits. Colonoscopies are also performed in individuals without symptoms to check for colorectal polyps or cancer. A screening colonoscopy is recommended for anyone 50 years of age and older, and for anyone with parents, siblings or children with a history of colorectal cancer or polyps. To have a successful colonoscopy, your bowel must be empty so that your physician can clearly view the colon. To do this, it is very important to read and follow all of the instructions given to you at least 2 weeks BEFORE your exam. If your bowel is not empty, your colonoscopy will not be successful and may have to be repeated. If you feel nauseated or vomit while taking the bowel preparation, wait 30 minutes before drinking more fluid and start with small sips of solution. Some activity (such as walking) or a few soda crackers may help decrease the nausea you are feeling. If the nausea persists, please contact nurse on call at 216.442.0310. You may experience skin irritation around the anus due to the passage of liquid stools. To prevent and treat skin irritation, you should: Apply Vaseline® or Desitin® ointment to the skin around the anus before drinking the bowel preparation medications. These products can be purchased at any drugstore. n Wipe the skin after each bowel movement with disposable wet wipes instead of toilet paper. These are found in the toilet paper area of the store. n Sit in a bathtub filled with warm water for 10 to 15 minutes after you finish passing a stool; after soaking, blot the skin dry with a soft cloth, apply Vaseline® or Desitin® ointment to the anal area, and place a cotton ball just outside your anus to absorb leaking fluid. During a colonoscopy, an experienced physician uses a colonoscope (a long,

flexible instrument about 1/2 inch in diameter) to view the lining of the colon. The colonoscope is inserted into the rectum and advanced through the large intestine. If necessary during a colonoscopy, small amounts of tissue can be removed for analysis (a biopsy) and polyps can be identified and entirely removed. In many cases, a colonoscopy allows accurate diagnosis and treatment of colorectal problems without the need for a major operation.

You are asked to wear a hospital gown and an IV will be started. n You will meet with an anesthesiologist who will discuss the plan for your sedation with you. n You are given a pain reliever and a sedative intravenously (in your vein). You will feel relaxed and somewhat drowsy. n You will lie on your left side, with your knees drawn up towards your chest. n A small amount of air is used to expand the colon so the physician can see the colon walls. n You may feel mild cramping during the procedure. Cramping can be reduced by taking slow, deep breaths. n The colonoscope is slowly withdrawn while the lining of your bowel is carefully examined n The procedure lasts from 30 minutes to 1 hour. n You will stay in a recovery room for observation until you are ready for discharge. n You may feel some cramping or a sensation of having gas, but this quickly passes. nIf sedation has been given,a responsible family member or friend must drive you home. n Avoid alcohol, driving, and operating machinery for 24 hours following the procedure. n Unless otherwise instructed, you may immediately return to your normal diet. We recommend you wait until the day after your procedure to resume normal activities. n If polyps were removed or a biopsy was taken, the physician performing your colonoscopy will tell you when it is safe to resume taking your blood thinners. n If a biopsy was taken or a polyp was removed, you may notice a little amount of rectal bleeding for 1 to 2 days after the procedure. If you have a large amount of rectal bleeding, high or persistent fevers, or severe abdominal pain within the next 2 weeks, please go to your local emergency room and call the physician who performed your exam.

Appendix B: Fecal Occult Colorectal Cancer Screening

(http://www.mayoclinic.org/tests-procedures/fecal-occult-blood-test/basics/how-you-prepare/prc-20014429?p=1)

MAYO CLINIC

Tests and Procedures

Fecal occult blood test

By Mayo Clinic Staff

The fecal occult blood test (FOBT) is a lab test used to check stool samples for hidden (occult) blood.

Occult blood in the stool may indicate colon cancer or polyps in the colon or rectum — though not all cancers or polyps bleed.

Typically, occult blood is passed in such small amounts that it can be detected only through the chemicals used in a fecal occult blood test.

If blood is detected through a fecal occult blood test, additional tests may be needed to determine the source of the bleeding. The fecal occult blood test can only detect the presence or absence of blood — it doesn't indicate potential sources of bleeding.

Your doctor may recommend a fecal occult blood test to:

Screen for colon cancer. If you're age 50 or older and at average risk of colon cancer, your doctor may recommend a fecal occult blood test every year to screen for colon cancer. In addition, however, you may need other screening tests that allow the doctor to examine the colon directly.

Evaluate possible causes of unexplained anemia. Anemia is a condition in which there aren't enough healthy red blood cells to carry adequate oxygen to your tissues. Sometimes a fecal occult blood test is used to determine whether bleeding in your digestive tract — such as a bleeding ulcer — is contributing to anemia.

Risks and limitations of the fecal occult blood test include:

The test isn't always accurate. Your fecal occult blood test could show a negative test result when cancer is present (false-negative result) if your cancer or polyps don't bleed.

Your test could show a positive result when you have no cancer (false-positive result) if you have bleeding from other sources, such as a stomach ulcer, hemorrhoid, or even blood swallowed from your mouth or your nose.

Having a fecal occult blood test may lead to additional testing. When the fecal occult blood test result is positive but a follow-up colonoscopy is normal, your doctor may recommend further observation with another fecal occult blood

test, evaluation of your upper gastrointestinal tract, a repeat colonoscopy or a combination of these.

Fecal occult blood tests can't detect all cancers. Some cancers detected by colonoscopy may not be detected by the fecal occult blood test.

Various foods, dietary supplements and medications can affect the results of some fecal occult blood tests — either indicating that blood is present when it isn't (false-positive) or missing the presence of blood that's actually there (false-negative). Your doctor may ask you to avoid certain foods or medicines. To ensure accurate test results, follow your doctor's instructions carefully.

For about three days before the test, your doctor may ask you to avoid:

Certain fruits and vegetables, including broccoli and turnips

Red meat

Horseradish

Vitamin C supplements

Pain relievers, such as aspirin and ibuprofen (Advil, Motrin IB, others)

There are several types of fecal occult blood tests, each with a different approach to collecting and testing stool. They include:

Guaiac fecal occult blood test (gFOBT). Your doctor typically gives you a test card with room for two or three samples or two or three test cards.

You collect a stool sample from each of two or three bowel movements in a clean container, usually taken on consecutive days, and then use an applicator stick to apply a smear of stool to a specific area of a card.

After the samples are dry, you return them to your doctor or a designated lab, by mail or in person.

Flushable reagent pad or tissue. You can get this kit at a store without a prescription.

You place the pad or tissue in the toilet bowl after a bowel movement, usually on three consecutive days. The pads change color when blood is present.

You then report the changes to your doctor, usually on a mail-in form.

Immunochemical fecal occult blood test (iFOBT, or FIT). The collection method for this test may depend on the manufacturer, but typically, you use a special spoon or other device to collect a sample of stool and store it in a collection container that comes with the test kit.

The collection container is then returned to your doctor or a designated lab, by mail or in person.

Immunochemical testing is newer than gFOBT. It doesn't require any dietary restrictions before sample collection, and testing can often be performed on a random stool sample. Immunochemical testing is also more sensitive than is gFOBT.

For accurate results, follow the instructions and return the samples promptly.

Your doctor will review the results of the fecal occult blood test and then share the results with you.

Negative result. A fecal occult blood test is considered negative if no blood is detected in your stool samples. If you had the test to screen for colon cancer and

you're at average risk — you have no colon cancer risk factors other than age — your doctor may recommend waiting one year and then repeating the test.
Positive result. A fecal occult blood test is considered positive if blood is detected in your stool samples. You may need additional testing — such as a colonoscopy — to locate the source of the bleeding.

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Jun. 06, 2014

Original article: http://www.mayoclinic.org/tests-procedures/fecal-occult-blood-test/basics/how-you-prepare/prc-20014429

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Appendix C: Participant Consent Form

Consent Form
The purpose of this research project is to determine what variables contribute to
completion of colorectal cancer screening.
You are invited to participate in this research project because you are age 50-75, do not
have a legal guardian, and have health insurance. You also have a diagnosis of a mental
illness and get services from a CMH agency.
Your participation in this research study is voluntary. You may choose not to participate.
If you decide to participate in this research survey, you may withdraw at any time. If you
decide not to participate in this study or if you withdraw from participating at any time,
you will not be penalized. You can still turn the uncompleted form in to the locked box
on this table.
The procedure involves filling out a short questionnaire that will take approximately 5
minutes. Your responses will be confidential and we do not collect identifying
information such as your name or insurance information.
This form will not be linked to you in any way. The results of this study may be
published and will be turned in to Walden University as part of a PhD Dissertation
project that Kelly Gardiner is part of. This agency is not otherwise involved in this
research.
This will not affect your treatment in any way from Kelly or anyone else because she will
not know whether or not you completed this survey.
I understand that my name will not be used and that the results will be studied for
research about colorectal cancer screening.
_____ ok (mark with an X)
If you have questions or concerns about this form, please contact
_____ (IRB person)

Appendix D: Poster in Lobby Explaining CRC Screening

A colonoscopy is a procedure where a medical provider puts a tube, with a camera on it, into your intestine. This is used to check for cancer or conditions that can turn into cancer. Prior to the test you have to take medicine that causes diarrhea and only drink clear liquids for an entire day. This will make sure that your intestines are clean for the camera to view them. You have to have someone drive you to the procedure, stay with you the entire time, and take you home afterwards.
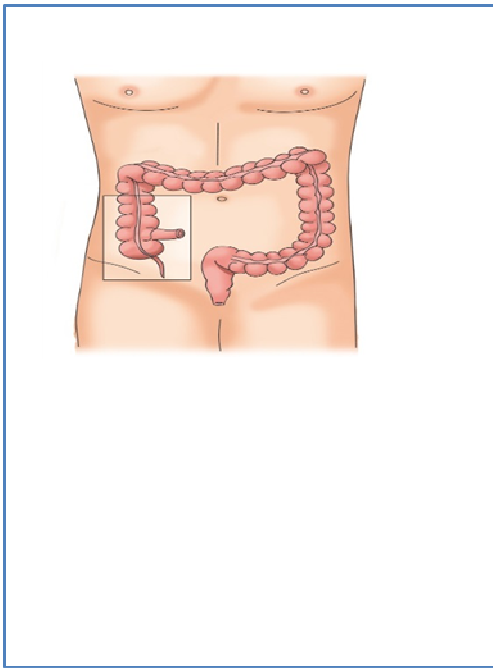
A Fecal Occult Blood Test is when your medical provider gives you a kit and you put three different samples of poop on the slide and mail it in an envelope that comes with the kit.

Appendix E: Poster in Lobby Asking for Participants

Are you age 50-75?
Are you a patient here?
Are you your own guardian?
Please help with valuable research!!!

Please fill out the short survey on the clipboard located on this table. Put it in the locked
box when you are finished.

Appendix F: Survey

Colorectal Cancer Screening Questionnaire
Age _____   Year you were born _____
Race _____
Male: _____   Female: _____   Transgender: _____
How far did you go in school?
Middle school _____   High School _____   GED _____
Beyond high school _____
Insurance: Medicaid _____   Medicare _____   Both _____   Not sure _____
1) Do you have someone who would take you to a medical procedure and stay with you for a few hours while it took place?
          Yes ____
          No ____
2) Did anyone ever ask you to get a colonoscopy?
          Yes ____
          No ____
3) Do you think you are physically able to complete the colonoscopy preparation?
          Yes ____
          No ____
4) Did anyone ever ask you to give a fecal (poop) sample on a glass slide?
          Yes ____
          No ____
    If YES, did you give the sample to the medical provider?
          Yes____
           No____
    If YES, how many years ago was it?
          _____
5) Did you know that it is recommended that you have a colorectal cancer screening after age 50?
          Yes ____
          No ____
    If you knew that you should get this test done, who told you about it?
          Family ____
          Friend ____
          Medical person ____
          Newspaper/TV ____
          Other ____
6) Please check reasons to get a colorectal cancer screening.
          Prevent cancer ____
          Check for cancer ____
          Remove cancer ____
7) Would you get embarrassed getting a colonoscopy?

Yes ____

No ____

8) Would you be ok if you had to drink only liquids for one day and these liquids would cause diarrhea?

Yes ____

No ____

9) If you knew you needed to get a colorectal cancer screening and did not get it done, why? (Can check multiple boxes)

No time____

Forgot ____

No one told me to get it ____

Not sure ____

Didn't understand the preparation before the test ____

Didn't have anyone to take me and stay with me during the procedure ____

Wasn't told to get it done ____

Fear of pain ____

Anxiety ____

Fear of being diagnosed with cancer____

Cancer doesn't run in my family ____

10) Did you notice any symptoms of potentially having colorectal cancer?

Yes ____

No ____

11) Have you actually completed a colonoscopy procedure?

Yes ____

No ____

How many years ago?_____

YOU ARE FINISHED UNLESS YOU HAVE OR HAVE HAD COLO-RECTAL CANCER IN THE PAST. Thank you.

12) Did you have or do you currently have colorectal cancer?

Yes_____

No_____

IF YES, What age were you diagnosed?_____

Did you have a colonoscopy or gave a poop sample in a kit to your medical provider prior to diagnosis, that was normal?

Yes_____

No_____

How old were you then?_____

How did you get diagnosed, if you have colorectal cancer?

FOBT_____

Colonoscopy_____

Did you have symptoms that made you get screened?

Yes_____

No_____