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Patient-Rated Physician Compassion and Patient Compliance with Colorectal Cancer Screening

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2022

Abstract

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MSOD, University of Pennsylvania 2004

MHA, University of South Carolina 1992

BA, Furman University 1990

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

In 2021, colorectal cancer was the second leading cause of cancer deaths in the United States, where screening prevented 46%–63% of colorectal cancer deaths. Compassionate care has been an area of study among scholars since Hippocrates. The purpose of this quantitative research study was to examine whether there was a relationship between the independent variables of provider compassion, patient gender, and length of provider patient relationship with the dependent variable of patient adherence behavior for prescribed colorectal cancer screening tests among primary care patients between 2019 and 2020 in a northeastern U.S. state. Guided by the theory of planned behavior as the framework for this study and using a sample size of 488 patients, a logistical regression analysis resulted in no statistically significant relationships between physician compassion, patient gender, length of provider patient relationship, and patient adherence to prescribed colorectal screening. However, the sample reported a higher colorectal cancer screening rate and a higher-than-average compassion score. The study contributes to positive social change by empowering physicians to focus on compassionate care through the emphasis on compassionate care relationships that may inspire cancer screening adherence and potentially save lives.

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Dedication

This degree and all my degrees are dedicated to my grandfather, James S. Pannucci. Although he never graduated from high school, he established a successful business and taught himself how to use a computer at age 80. He always taught me that education was something no one could take away from you and that I should shoot for the stars in getting as many degrees as I could. Pop Pop, this one is for you!

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Chapter 1: Introduction to the Study

Health care administrators must prioritize health care quality improvement as a central responsibility at the heart of their role (World Health Organization, 2018). A focus on high-quality outcomes can impact both the patients served and the reputation of the institution that is administratively led. Although outpatient ratings of healthcare quality by patients took into account many factors, positive patient-rated experiences with their provider were a key metric that was isolated as an important component of overall patient-rated quality outcomes (Kumah et al., 2017). In fact, patients that rated their clinical visit satisfaction higher also seemed to associate that experience with higher quality (Kumah et al., 2017). Thus, the general concept of isolated elements that influence a patient's perception of quality inspired this research project. Patient trust in a provider and feelings that they were compassionate may have promoted a higher likelihood of adherence to the provider's recommendations, which led to improved quality care outcomes for patients (Sinclair et al., 2016). Assisting providers by making a thorough investment in people-centered elements of the care experience led to increased patient empowerment and encouraged active patient participation in follow through with care (Amuito-Kareaga et al., 2017). As suggested by Hesse and Rauscher, (2019), a provider–patient relationship based on encouragement was linked to improved overall care quality and dramatically impacted the social problem of overall health care quality. In this study, I determined the association between specific provider behaviors, like compassion and treatment adherence outcomes, to demonstrate the impact of physician compassion on quality outcomes. This connection between patient-rated physician

compassion and patient adherence regarding cancer screening tests led to increased early detection through improved compliance with colorectal cancer screening tests, which positively impacted the social problem of quality health outcomes. Kerasidou et al. (2021) maintained that health systems had a role in policy design for their care settings to value the role and impact of compassion. In fact, Kerasidou et al. suggested that this type of focused attention through organizational policies from a health system encouraged physicians to highlight compassion in their care delivery. This level of concentration on the emotional connection between a patient and provider within the health care relationship yielded improved patient adherence to prescribed tests and treatments.

In the current study, I established there was not a statistically significant relationship between compassion and adherence to cancer screening tests. Although the overall findings were not statistically significant, the fact that a perfect patient-rated provider compassion rating resulted in higher than U.S. average compliance for colorectal cancer screening could point to a new focus area for reduction in cancer mortality and possibly avoidable deaths (see Smith et al., 2018). The findings from the current study indicated that the patient's positive feelings about provider compassion could have led to adherence with colorectal cancer screening, which would lead to improved overall health quality through early identification and potentially reduced deaths from cancer.

Background of the Study

Compassion was defined as an active state that compelled one into action to alleviate suffering and demonstrated a link to patient satisfaction and patient compliance

(Roberts et al., 2019). The evolution of compassion as a stand-alone phenomenon has been debated since Aristotle, yet the concept always involved action to relieve suffering (Malenfant et al., 2022). The initial physician–patient relationship required both trust and action to develop between acquaintances. Compassion remained an important element for the physician to foster in the relationship. Synderman and Gyasto (2019) described compassion as integral in the physician–patient relationship due to the need for deep trust between the two in order to inspire action on treatment recommendations. In fact, Singh et al. (2018) made the claim that compassion is crucial to the provision of quality health care due to the trust required by a patient to adhere to a physician's recommendations. Thus, compassion has been considered a foundational component of the provision of patient care that assisted in the advancement of the patient-physician relationship (Singh, et al., 2018).

Patient-Rated Provider Compassion

Liang et al. (2017) suggested that a pleasant relationship between a provider and a patient was something that the patient could judge; provide feedback on; and based upon that good feeling about the relationship, could make an assessment about the physician's quality. Trzeciak et al. (2017) offered that this type of patient comment survey validated that compassion was an important element in the overall care delivery experience. Patient survey response reports deemed physician compassion valuable in a number of care delivery settings. In outpatient mental health situations, therapeutic relationships that were built on trust and compassion produced positive feelings toward treatment adherence (Limandri, 2020). Anghel et al. (2018) uncovered that a positive, trusting

relationship with the physician impacted the patient's adherence in a rheumatology setting. This positive feeling toward the physician from the patient was found even when the patient was presented with fictious clinical vignettes (Heinze et al., 2020). According to Heinze et al. (2020), patients looked for physician compassion even in experimental provider scenarios. In 2020, Keulen et al. recounted a Hippocrates quote, "the patient, though conscious that his condition is perilous, may recover his health that simply through his contentment with the goodness of the physician" (p.600). This again supported the concept that the patient–physician relationship was impacted by patient behavior through the suggestion that a patient recovered their health simply through their contentment with the goodness of the physician.

To this end, a five-item survey methodology was validated through a confirmatory factor analysis to rate the compassion of providers in an outpatient setting through the Press Ganey survey and provide an objective patient-rated provider compassion measure (Roberts, et al., 2019). I used the five-item Compassion Scale developed by Roberts et al. (2019) and administered with the Clinician and Group Consumer Assessment of Healthcare Providers and Systems Survey (CG-CAHPS) survey in the current study to determine if patient-rated physician compassion impacted patient compliance with colorectal cancer screening tests. Determining if there is a higher rate of compliance with colorectal cancer screening if the patient rated their provider as having high compassion could be have a positive impact on overall health care quality.

Colorectal Cancer Screening

According to the U.S. Preventative Task Force, the screening guidelines suggested in 2019 for persons 50–75-years-old with average risk were a colonoscopy every 10 years or a blood stool test every year (Davidson et al., 2021). Of this age group in the United States, 68.8% got screened for colorectal cancer, which was not at the desired level of 70% compliance as stated in the public health goal document Healthy People 2020 (Davidson et al., 2021). Several factors were associated with lack of colorectal cancer screening, including lower age, insurance status, patient gender, and not seeing a physician routinely (Davidson et al., 2021). There was a lack of literature that evaluated a direct association between patient-rated provider compassion and patient behavior regarding obtaining routine colorectal cancer screening exams. There was, however, evidence that suggested a conversation with a physician impacted the compliance rate for colorectal cancer screening (Ghai et al., 2020; Joseph et al., 2018; Murphy et al., 2020). However, narrowing down which specific element within the physician-patient interaction has an effect on colorectal cancer screening adherence has not been studied. The trait of compassion has been understood as an important element for effective provider and patient relationships (Roberts et al., 2019). Freeman-Hildreth et al. (2019) suggested that a high compassion rating of a physician had a significant connection with improved patient self-management skills of a chronic disease. Additionally, the absence of research on provider compassion as a stand-alone quality of positive patient–physician interactions and its impact on patient adherence could be seen as a missing element to improve health outcomes (Tanco et al., 2015). Peterson et al.

(2016) found that positive provider communication influenced patient behavior surrounding adherence to prescribed cancer screening tests and suggested that the exploration of a variety of positive communication nuances could reveal more about the specific aspect of provider communication that effected patient adherence. Since compassion was thought of as an inspirational action to diminish distress, this study's exploration of the influence of provider compassion on patient adherence to colorectal cancer screening tests could add to the health services community knowledge of the specific essentials that could enhance provider communication and positive patient outcomes (Tanco et al., 2015).

Problem Statement

The specific research question that was addressed through this study was: Does a patient-rated provider compassion rating impact patient adherence behavior for colorectal cancer screening tests? Colorectal cancer was the second leading cause of cancer death in the United States at the time of this study (Cancer.org, 2021). According to Ladabaum et al. (2020), colorectal cancer screening prevented 46%–63% of colorectal cancer deaths. Therefore, activities that increase the number of eligible patients screened for colorectal cancer, theoretically would add to lives saved and positive health care outcomes. Compassion and trust in a physician had been documented to increase compliance with adherence to assigned treatments and tests (Orom et al., 2018). Dougherty et al. (2018) demonstrated through a meta-analysis that both physician support for the screening and patient-specific navigation assistance both increase the overall colorectal cancer screening rates. Bachman et al. (2018) reported that a physician's explanation regarding

colorectal cancer screening, built trust with the patient and supported the patient's understanding of the test's importance. Patel et al. (2019) found that specific actions during a visit (e.g., sitting instead of standing, sensitivity to patient body language of understanding, and offering nonverbal affirmation cues like nodding), also add to the trust building and compassionate feelings between a physician and patient. Conversely, Ghimire et al., (2017) found that if this compassion in interactions is absent, treatment adherence can be affected. Thus, if physician compassion could be shown to influence patient adherence to their routine colorectal cancer screening, this finding could be important to public health and health system-driven efforts for increased screening rates.

Purpose of the Study

The purpose of this quantitative research study was to examine whether there was a relationship between provider compassion, patient gender, and length of provider patient relationship with patient adherence behavior for prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020. Roberts et al. (2019) found that compassionate physician communication could increase patient compliance with tests, treatment, and overall satisfaction with the provider relationship. Other variables could also impact a patient's rating of physician compassion. Heinze et al. (2020) found that patient gender may have an influence on physician compassion ratings and suggested that compassion matters to patients through their responses to fictious patient and physician vignettes. These vignettes demonstrated physicians talking with patients about different clinical diagnoses and served to confirm patients' preference

for compassion in a traditional medical appointment. Valery et al. (2020) discovered another variable of interest in evaluating physician compassion and treatment adherence, finding that the number of visits that a patient had with a physician positively impacted adherence to colorectal cancer screening. Thus, the variables explored in this study included the patient rating of a providers' compassion level, the compliance of that provider's eligible patients with colorectal cancer screening tests, age range of patients, gender of both patient and provider, race of patient and provider, and length of time of the relationship between patient and physician. For this study, the independent variable was the patient-rated provider compassion score, and the dependent variable was compliance with prescribed colorectal cancer screening tests. Covariates explored in the quantitative analysis included length of provider-patient relationship and patient gender. I tested the associations between the independent and dependent variables through a logistical regression analysis with patient gender as a moderating variable and length of physician–patient relationship as a mediating variable.

Research Questions and Hypotheses

RQ1: To what extent does patient-rated provider compassion have a relationship with patient adherence behavior for prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020?

$H_0$1: Higher ratings of provider compassion have no effect on patient adherence behavior for prescribed colorectal cancer screening tests

$H_1$1: Higher ratings of provider compassion impact patient adherence behavior for prescribed colorectal cancer screening tests

RQ2: What is the relationship between patient-rated provider compassion, length of provider–patient relationship, and patient adherence behavior to prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020?

$H_0$2: Higher ratings of patient-rated provider compassion and longer lengths of provider–patient relationships have no effect patient adherence behavior to prescribed colorectal cancer screening tests

$H_1$2: Higher ratings of patient-rated provider compassion and longer lengths of provider–patient relationships impact patient adherence behavior to prescribed colorectal cancer screening tests

RQ3: What is the relationship between patient-rated provider compassion, gender of the patient, and patient adherence behavior to prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020?

$H_0$3: Higher ratings of patient-rated provider compassion and patient gender have no effect with patient adherence behavior to prescribed colorectal cancer screening tests

$H_1$3: Higher ratings of patient-rated provider compassion and patient gender have a relationship with patient adherence behavior to prescribed colorectal cancer screening tests

Theoretical Foundation

I used the theory of planned behavior (TPB) as the theoretical framework for this study. The theory was first popularized by Ajzen (1985) who discussed the concept of

behavior being guided by intention and that all behavioral aims do not become realized. In the theory, Ajzen considered the impact of the attitude toward the behavior choice, whether the behavior has become normative, and the patient's perception of their control over the desired behavior. The application of Azjen's theory to health screening adherence was supported by Godin and Kok (1996) who found screening adherence may be a result of created norms and attitudes toward personal responsibility to carry out the behavior. Ajzen (2015) also described the theory as a means to predict intention and ensuing behavior. Previous researchers have used TPB as a framework to explore the influencers of attitude surrounding a person's intention to complete a particular behavior (Ajzen, 2015). Horne et al. (2017) found that a physician's recommendation influenced intention and adherence to the desired action. Wollancho et al. (2020) also found that the patient's attitude toward a cancer screening test was also an important component of their intention to complete it, yet there was inconsistency in the behavior actually being completed. In this study, I employed TPB as a lens through which to view the relationship between patient-rated physician compassion on a patient's completion of their prescribed colorectal cancer screening tests.

Nature of the Study

In this quantitative study, I employed a quasi-experimental design, specifically using a time sample approach. Campbell and Stanley (2015) suggested that this type of design, specifically an equivalent time sample approach, is a common tactic to use to collect two sets of measures to compare the effects of an experimental variable. I conducted this study to determine if a relationship exists between patient-rated provider

compassion and patient adherence with prescribed cancer screening tests with the intervening variables of patient gender and length of relationship between provider and patient.

I used two data elements for analysis: The five-item patient-rated compassion composite score provided data for the independent variable, and the patient outcome of adherence to prescribed cancer screening tests was the dependent variable. To examine the relationship between variables, I used logistical regression analysis with both moderating and mediating variable examination. This regression analysis method was suggested based on the types of variables and desired outcomes to be explored through this study (see Pokhariyal, 2019). According to Pokhariyal (2019), the review of mediation and moderation can explain relationships and proportions of variance. The data from the five-item compassion scale was a continuous variable and the data reflecting the patient adherence to their assigned cancer screening test was a binary value that demonstrated the correct variable patterns for a logistical regression study (see Ranaganthan et al., 2017). According to Baron and Kenny (1986), behavioral intention was an example of a mediation relationship. Through examining the mediation effects of length of provider and patient relationship on patient-rated provider compassion and the outcome of compliance with prescribed cancer screening tests, I evaluated the impact of length of provider–patient relationship on the independent and dependent variables. Baron and Kenny (1986) also described moderating variables as those that can affect the direction or strength of the relationship, and to that end, gender was also examined in this study.

Definitions

The data used in this study were generated from northeastern, hospital-based, primary care practices with 24 primary care outpatient sites in both urban and suburban settings throughout southern New Jersey. Primary Care was defined as both internal medicine and family medicine physician visits. I analyzed the outpatient clinic data for patients who were 49 years old and older who had visits that occurred in April - December 2019. The data were then analyzed to determine the population of patients that completed a CG-HAPHS survey with the Compassion Scale and then further analyzed to ascertain which patients also had an active colorectal cancer screening provider order compared to the screening test being completed within 2019–2020 timeframe. The independent variable results came from the patients' responses on the five-item Compassion Scale about the specific internal and family medicine physicians they saw during their clinic visit in April -December 2019. The dependent variable of completed colorectal cancer screening tests data was queried through the electronic medical record (EMR) for the same provider's eligible patients over the course of the year of April 2019–December 2020. I defined the length of relationship between patient and the physician as an interval scale by reviewing EMRs from 2019 retrospectively back 6 years to 2014 to establish if there was a visit between the internal or family medicine physicians and the patient in 2014. The EMRs were then searched for visits for each year (i.e., 2015, 2016, 2017 and 2018) to determine when, and if, an initial visit occurred within that 5-year time horizon. The patient's length of relationship with the physician was categorized into 5 years and greater (i.e., 2014 as an initial visit), 1–4 years (i.e.,

2018, 2017, 2016, or 2015 as an initial visit) and less than 1 year (i.e., 2019 as an initial visit).

Scope and Delimitations

There are many methods to manage internal validity and the sequencing of the variables examined once one technique was employed. According to Warner (2013), an experimental design should create the ability to suggest a cause-and-effect relationship. When examined in a study, this causal relationship should have the cause preceding the outcome in question, which could be a method to accomplish internal validity. In the current study, the rating of the physician's compassion was evaluated prior to knowing if the patient completed their colorectal cancer screening test. Another means of supporting internal validity is to substantiate the causal association with a plausible theory to suggest a relationship could exist (Warner, 2013). For the current study, the theory of planned behavior provided such a basis for the connection of patient-rated provider compassion and patient adherence to prescribed colorectal cancer screening. In the theory, it is suggested that intention is guided by attitudes about the behavior, subjective norms, and perceived behavioral control (Ajzen, 1985).

External validity was defined as the ability to generalize the results of the experiment outside of the study population (Warner, 2013). Given that the study population represents a broad sample of primary care patients, a commercially available rating scale for physician compassion was used for assessment, and all the variables were evaluated retrospectively in this study, several threats to external validity were addressed through the use of a deliberate experimental design. Handley et al. (2018) suggested that

if an intervention was applied to an entire population, as in the current study, that intervention could it mimicked real-world conditions and could enhance the ability to generalize results.

Limitations

A limitation that could affect the strength of the relationship between the variables under study was a disproportion number of responses received for one physician with a higher-than-average compassion rating compared to their peers. This type of result may have skewed the compassion results in relation to the patient response and impacted the external validity of the study. Another limitation was the timeframe of the data collection. During 2020, elective outpatient procedures, such as colonoscopies, were stopped across the United States as a precautionary measure to combat the COVID-19 pandemic for a period of time. This unusual event might have artificially impacted compliance rates for colonoscopies. In addition to these key limitations, a few potential biases also existed within this study. Since the study took place at the institution where I work, the first potential bias revolved around separation between my role at my institution and my role as a researcher in the use and analysis of this data. Another challenge might have been lack of support from the primary care division at the institution when exploring their data.

Significance of the Study

Despite the limitations, the study might still contribute significant information to enhance the strategies used to improve patient compliance to assigned preventative tests and treatments. Cancer prevention and screening has been proven to save lives. Davidson et al. (2021) suggested that if an 80% compliance rate could be attained for colorectal

cancer screening by 2030, an additional 203,000 deaths could be averted. Harber et al. (2021) estimated that approximately 1,500 additional lives might be lost to late-stage colorectal cancer in the United Kingdom based on the shutdown of screening tests during the pandemic, demonstrating the power of early detection.

Summary

The findings of this study regarding the positive influence of provider compassion on the patient intention and actualization of completion of colorectal cancer screening within the year of prescription could have a positive potential impact on saving lives from colorectal cancer. According to Nisson and Earl (2020), impacting a person's intention would assist in achieving the objective behavior desired. If intention to complete colorectal cancer screening could be associated with high patient-rated physician compassion, the implications for hospitals and provider education will be rich with possibilities to enhance the characteristics of physician–patient communication that were surveyed through the five-item Compassion Scale. This information could then save lives through encouraging additional patients to complete their screening for colorectal cancer.

Chapter 2: Literature Review

Physician Impact

Compassion has long been a notable quality of health care professionals; Hippocrates suggested that wherever the art of medicine is loved, there is also a love of humanity (Wald et al., 2019). Compassion was described as an active state that compelled one into action to alleviate suffering and was linked to patient satisfaction and patient compliance (Roberts et al., 2019). However, this basic appeal for physicians to have compassion for their patients is often mislabeled and misinterpreted. In fact, the evolution of compassion as a stand-alone phenomenon has been debated since Aristotle because it was often confused with empathy or distress (Goetz et al., 2010). The phenomena of a clinician caring could be described by patients as empathy, sympathy, or compassion, and these emotional responses, although similar, had distinct definitions and reactions. Mascaro et al. (2020) described compassion as a changeable state based on a teachable behavior. Taylor et al. (2019) proposed that sympathy, as a concept, suggested feeling sorry for another's pain without a shared experience. Weller and Jowsey (2020) pronounced that there was confusion of the phenomena of empathy and compassion and offered the distinction that empathy recognized a situation that was difficult, whereas compassion took action to resolve the difficulty. Patel et al. (2019), outlined that both empathy and compassion were elemental in a patient–provider relationship, and although narrowly linked, the authors agreed that the terms have different definitions. Goetz et al. (2010) suggested that compassion could deepen bonds and motivate action interactions between acquaintances; therefore, in a physician–patient relationship, physician

compassion might inspire action from the patient as a result of their relationship with the provider. Trzeciak et al. (2017) determined that the phenomenon of compassion played a substantial role in the delivery of quality care. These conclusions about the importance of compassion to quality have been supported by studies from the United States, Ireland, United Kingdom and Sweden (Trzeciak et al., 2017). The issue that prompted this literature search was health care quality as related to the influence provider compassion has on a patient's adherence with prescribed cancer screening tests.

Quality of care has been linked to the mutual trust developed over time between a patient and their physician because this reciprocal trust provided a level of satisfaction for the physician and strengthened follow through on physician recommendations from the patient (Grob et al., 2019). This concept of trust supported patient adherence to an agreed upon physician prescribed treatment course. In fact, if a patient trusted a provider and felt they were compassionate, they had a higher likelihood of adhering to their recommendations (Sinclair et al., 2016). Assisting providers in understanding these people-centered elements could lead to patient empowerment and, therefore, the active participation in follow through with prescribed care (Amuito-Kareaga et al., 2017). Consequently, a compassionate provider–patient relationship might be linked to enhanced care quality and could dramatically impact the social problem of health care quality if a strong association between provider compassion and screening behavior could be established (Hesse & Rauscher, 2019). In addition, Singh et al. (2018) found that patients follow instructions more often if they consider a physician compassionate. Determining this connection between patient-rated provider compassion and patient follow through

regarding prescribed cancer screening tests could lead to enhanced early detection and, thus, earlier disease intervention that could result in improved patient outcomes. Fernando and Consedine (2017) found that there were some physician-related barriers that may impede compassion for their patients. Once the physicians were aware of this feedback, the findings showed that physicians could change their approach to engender increased compassion for their patients (Fernando & Cosedine, 2017).

The connection between physician compassion and patient action appeared to transcend care delivery settings. When outpatient mental health situations dictated therapeutic relationships that were built on trust and compassion, it produced positive patient feelings toward treatment adherence (Limandri, 2020). Heinze et al. (2020) found that even when presented experimental clinical vignettes, patients looked for compassion in the fictious provider scenario. Thus, provider compassion seemed to have influenced a patient's actions. Although researchers have investigated the link between provider compassion and patient adherence to prescribed treatments, the topic has not been fully explored in relation to a physician's compassion as a positive impact on adherence to assigned cancer screening tests. Therefore, I conducted this study to objectively compare a patient's rating of their perception of a providers' compassion while evaluating the patient's behavioral outcomes regarding cancer screening tests to determine the relationship between provider compassion and patient behavior.

Cancer Screening

Cancer screening tests remain critical in the early detection of malignancies, which improves a cancer patient's chances of survival (Smith & Oeffinger, 2020). Goto

et al. (2018) also found that cancer screening had a positive impact on overall health. Since an organized national system of cancer screening does not exist, the responsibility for this important aspect of care was left to individual primary care physicians to ensure their patients are compliant with age- and birth gender-based prescribed screening tests (Smith & Oeffinger, 2020). Lynn et al. (2018) found that the primary care physician's communication about cancer screening made an impact in the uptake of prescribed screening tests. In fact, Harper et al. (2021) reported that primary care physicians' communication about cancer screening tests was so essential that it was included as an important goal in Healthy People 2030.

Since colorectal cancer is one of the most preventable and treatable cancers if detected in its earliest phases, colorectal cancer screening was the focus for this study (Ladabaum et al., 2020). Colorectal cancer screening has proven to be an effective method in early detection against the second-leading cause of cancer deaths in the United States (Laird et al., 2020). However, only 63% of the age-eligible U.S. adults are compliant with this screening, conflicting with the national goal set by the American Cancer Society of having 80% of adults meeting this screening criterion (Dougherty et al., 2018). There have been many reasons cited for this lack of compliance, including embarrassment, fear, confusion about the age criterion, and lack of insurance coverage for the test (Reynolds et al., 2018). However, Huei-yu Wang et al. (2018) found that a primary care physician's communication about colorectal screening could impact whether the patient follows through with the screening. Additionally, de Moor et al. (2018) found that patients whom have seen their primary physician within the past year

had a higher level of compliance with colorectal cancer screening. In summary, colorectal cancer screening is a significant way to impact quality of care through early detection and screening uptake, which appears to be impacted by communication with a primary care physician. Therefore, understanding more about the specific impact of primary care physician communication could increase the number of patients who get their colorectal cancer screening.

Patient Feedback Mechanism

Survey sampling methods, such as the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAPHS) or (CG-HCAPHS), provide a mechanism to for patients to evaluate health care situations in which they were shown compassion (Mascaro et al., 2020). Trzeciak et al. (2017) offered that the five-item survey methodology embedded in the survey instruments above provided confirmation that compassion was an important element in the overall care delivery experience. This five-item question series related to the patient's rating of the physician's care for their well-being, interest in the patient as a whole person, consideration of the patient's personal needs, ability to gain their trust, and ability to show care and compassion (Roberts et al., 2021). Sabapathi et al. (2021) confirmed patient-rated compassion of a health care provider was important to the patient experience in the emergency room setting. Roberts et al. (2021) validated this same five-item patient-rated provider compassion survey scale in outpatient and acute care hospital settings through a confirmatory factor analysis, and the scale was added to the national patient satisfaction surveys offered by Press Ganey. Rodriguez and Lown (2019) also demonstrated the validity of another mechanism to

describe compassion called the 12-Item Schwartz Center Compassionate Care Scale. These surveys offered reliable mechanisms through which patients rated their health care provider's compassion. I used the five-item Compassion Scale offered by Roberts et al. (2019) and administered with the CG-CAHPS survey in this study to determine if patient-rated physician compassion impacted patient compliance with cancer screening tests.

Literature Search Strategy

To locate literature on the topic of patient-rated provider compassion and the impact on patient behavior, I searched the following databases and search engines: SAGE Journals, Taylor and Francis Online, Thoreau, Elsevier, and Google Scholar. The keyword search terms used included *provider compassion, patient behavior, patient provider relationship, compassion impact on patient outcomes, cancer screening behavior*, *patient intention*, and *provider trust*. In other searches, I used combinations of these words to yield additional information. The searches were concentrated on literature published between 2017 and 2021, with seminal theories extending the search years into the mid-1980s. Since there were few articles that used provider compassion as the specific variable of impact on patient adherence with cancer screening tests, I widened my literature search to include a variety of cohorts that have been evaluated in a similar way, such as diabetic patients, HIV patients, mental health patients, and families with autistic children. All these populations were the subject of some research about the relationship between provider compassion and a desired outcome that improved the specific health condition. Thus, the association between perceived provider compassion and a patients' action had been deliberated among other patient disease states and

demonstrated desired outcomes, which suggested that compassion may have an impact on patient's adherence to cancer screening tests. In the theory of planned behavior, it was proposed that behavior is influenced based on intention and three associated factors: attitude regarding the behavior, perceived control of the action, and standards around the behavior (Sussman & Gifford, 2019).

Theoretical Foundation

The TPB was first established by Ajzen to explain how a behavioral model of intention could influence any behavior (Ajzen, 1985). The theory includes that the prediction regarding intention to complete a certain action could stem from the various factors surrounding attitude, control, and acceptance, which influence future participation in a given behavior. This theory had been applied to environmental, health, and social behaviors (Ajzen & Schmidt, 2020). The basis for intention within the theory grew from the three elements that make up the theory: perceived behavioral control, attitude toward performing the behavior, and subjective norms around the behavior (Ajzen, 2020). According to the theory, these aspects work together to form an intention to complete a designated behavior (Ajzen & Schmidt, 2020). The addition of a timeframe in which the defined behavior should be completed increased the explanation of variance attributed to the intention and behavior achievement (Ajzen & Schmidt, 2020). The creation of a normative standard and prescribed timeframe could influence follow through on certain health behaviors through development of a personal intention to complete these certain health behaviors (Buhmann & Bronn, 2018). In fact, attitude toward a behavior was thought to be a significant contributor to the overall explanation of variance based on the

TPB. Callow and Callow (2021) confirmed this finding about attitude guiding behavior with the uptake of COVID-19 vaccination. Faisal et al. (2020) also found attitude to be important to physician acceptance and application of new pharmaceutical information. Additionally, Ferreira and Perira (2017) found attitude toward prescribed diet and exercise increased patient adherence.

In order to describe the important concepts of intention and perceived control, Godin and Kok (1996) demonstrated the application of TPB in a variety of health behaviors, which suggested that TPB had an influence on extinguishing behaviors that were contrary to good health, such as smoking, drinking, and eating disorders. In their meta-analysis of behaviors examined with this theory, the authors evaluated the correlation with intention and perceived control and suggested that there was substantive evidence to support intention as a predictor of behavior. Similarly, Roncancio et al. (2015) evaluated the TPB's ability to reveal cervical cancer screening intentions among Latinas. The authors employed a qualitative approach to explore opinions about pap screening and formulated a survey instrument that was administered over a defined period of time to ascertain the compliance with obtaining the cervical cancer screening test. The elements of behavioral control and subjective norms that influenced intention to complete screening tests was consistent with other studies that used the TPB as a basis (Roncancio et al., 2015). In another application of the TPB, Mirzaei-Alavijeh et al. (2018) evaluated its use in mammography behavior for Iranian women and found that perceived behavioral control of the participant had a significant impact on completion of mammography screening. The researchers developed a questionnaire to solicit the

participants attitudes about the three core elements included in TPB in reference to mammography using a Likert scale. They used a regression analysis to evaluate the results of their study, which were consistent with other studies regarding perceived behavioral control and subjective norms being important variables that influenced uptake of mammography. Huang et al., (2020) conducted a survey about colorectal cancer screening using the elements from TPB to determine a relationship with screening uptake. The findings of their quantitative analysis suggested that perceived behavioral control does have a significant association with colorectal screening uptake. These results were consistent with other studies regarding colorectal cancer screening in terms of the elements of TPB demonstrating a relationship with overall uptake of this type of screening (Huang et al., 2020).

Therefore, this relevant literature points to TPB suggesting a relationship between perceived behavioral control and the completion of cancer screening tests. In the current study, I focused on the relationship of behavioral control over colorectal cancer screening and patient-rated physician compassion.

Literature Review Related to Key Variables and/or Concepts

Compassion

Sinclair et al. (2017) conducted a thorough evaluation of compassion measurement instruments and found that the reliability of these tools was questionable due to the subjective nature of patient-rated physician compassion. However, the need for a valid tool that could transcend different care experiences seemed to be an important instrument to develop because a compassionate care relationship between patient and

provider had been demonstrated to improve patient outcomes (Sinclair et al., 2017). Roberts et al. (2019) validated such a tool in the outpatient setting that provided a way for patients to rate their physician's level of compassion exhibited during their outpatient clinic visit. The results of this tool could inform the type of impression a physician made on the patient. Lafleur et al. (2019) found that interpersonal proficiencies were important because they influence the patient's relationship with the provider. Although compassion and other descriptive words, such as empathy and sympathy, were sometimes used interchangeably, compassion expressed an action to alleviate suffering, and this remains an important distinction in how compassion could matter in a physician–patient relationship (Jeffrey, 2016). The concept of action to relieve suffering embedded in the definition of compassion provided an action-oriented approach demonstrated by the physician with their patient as they assign medications, treatments, and tests (Gilbert et al., 2019).

Lin et al. (2017) found that patient experience with supportive communication that was built on trust and care led to better adherence with oral chemotherapy in breast cancer patients. The link between compassionate communication with a physician and improved treatment plan follow up and compliance led to the belief that compassion could make a difference in how a patient followed assigned screenings as well. In fact, Fuertes et al. (2017) suggested that trust gained through a caring relationship between physician and patient could positively impact care outcomes. Thus, a high compassion rating of a patient's physician could make a positive impression of how a patient feels about the provider and, in turn, influence how the patient followed the physician's

instructions. Trust that was cultivated through a patient's belief of care and compassion from their provider is vital in adherence to the provider's treatment plan (Lin et al., 2017). Compassion could be increased among providers through training for the provider about techniques that assisted in relationship development and communication with the patient (Patel et al., 2019). This type of awareness education might be achieved through sharing patient-rated provider compassion scores from the CG-HAHPS.

Length of Relationship

Whereas patient cohorts have been studied to seek the impact of provider compassion on patients' perception of them, some studies have also evaluated the influence of compassion on the patient's corresponding actions. Wood et al. (2018) suggested that robust relationships between patient and provider that engendered empathy, compassion and trust, created a therapeutic alliance in chronic HIV patients. This type of alliance has been described by Sinclair et al. (2018) as a relationship which suggested a true connection, where the provider cultivated a rapport to know the patient beyond their illness, provided devoted attention during their visit and related to the patient in a way to engender a comfortable verbal exchange. Therefore, exploring the elements that strengthen a relationship would assist in understanding the influence of compassion in a provider patient relationship. Sinclair et al. (2020) also explored the elements of provider compassion in the pediatric patient population. These findings provided additional clarity about key elements that suggested evidence of provider compassion, such as length of relationship, physician communication and coordination of care (Sinclair et al., 2020). In an adult setting, the length of the patient's relationship with

the physician might also assist in enabling a deeper level of personal connection and trust to develop. As trust has been found to be an important foundational component in provider relationship building, a longer length of a physician patient relationship could lead to more trust and therefore enhanced patient compliance (Schoenthaler et al., 2018). Schwartz et al. (2017) suggested that a patient may attribute the quality of a relationship with their provider as a justification for their adherence to their prescribed diabetes medication. In fact, Bussell et al. (2017) found that in diabetic patients, the length of relationship with their provider enhances the ability to develop trust in that provider and follow their treatment recommendations. And, Valery et al. (2020) also found that in colorectal cancer screening that the number of visits to the patient's primary care physician, positively impacted the patient follow through on completing their colorectal cancer screening. Thus, length of relationship could be a factor to consider in rating a provider high in compassion and may influence the patient's decision to follow instructions from that provider (Bussell et al., 2017).

Patient Gender

Another variable of interest, was the gender of the patient in the provider patient relationship and whether patient gender might impact their rating of their physician's compassion. According to research through the American Cancer Society, the incidence of colorectal cancer and death is higher in men as opposed to women (Meester et al., 2018). This finding increased the importance of gender as a variable to explore patient rated provider compassion on patient adherence. Mehra and Mishra (2021) found that female patients tend to rate physicians with higher satisfaction scores who provided a

perceived greater degree of communication. In fact, Harper et al. (2021) suggested that provider communication is so important that it is now a goal within Healthy People 2030, as its recommendations yielded higher uptake of cancer screening of all varieties. In this way, perceived communication added to the overall positive perception of a physician. Roberts et al. (2019) suggested that compassion, caring and communication are not interchangeable. They also suggested that additional research is needed to determine which elements of communication were impactful to have a patient, male or female, positively respond (Roberts et al., 2019). In addition, Fortuna et al. (2018) also found that there is a link between medication adherence and patient satisfaction, yet did not assess any significant difference due to patient gender. Both Elsous et al. (2017) and Bener et al. (2017) found that female gender did have an association with higher compliance to diabetes medication. Whereas, Hussain et al. (2018) found that men had better adherence to post myocardial infarction treatment protocols. Thus, gender could be an influential variable to assess in its influence on patient follow through on treatment protocols.

In summary, the variables of patient compassion rating, length of relationship with the physician and patient gender all demonstrated some influence on preventative screening adherence behaviors which is the basis for inclusion of these variables in this study. Compassion ratings and length of relationships typically had a positive effect on adherence, while gender had an unpredictable effect. Thus, learning more about these antecedents to compliance with assigned preventative cancer screening tests could assist in overall improved quality of care.

Summary and Conclusions

There appeared to be a gap in the literature regarding patient rated provider compassion and its association with patient compliance in obtaining colorectal cancer screening exams. This gap was supported by the findings of Freeman-Hildreth et al. (2019), where a high compassion rating of a physician had a significant connection with improved patient management abilities of a chronic disease. Additionally, this gap of provider compassion, as a stand-alone quality, was seen as a foundational element for patient centered care and improved health outcomes (Tanco et al., 2015). The trait of compassion has been seen as an important element for effective provider and patient relationships (Roberts et al., 2019). Peterson et al. (2016) also found that positive provider communication influenced both provider and patient relationships, as well as patient behavior surrounding adherence to prescribed cancer screening tests. It was suggested that exploring a variety of communication nuances could reveal more about the specific impact a compassionate provider message had on patient adherence (Peterson et al., 2016). Compassion could be thought of as an inspired action from one to another in order to diminish distress (Tanco et al., 2015). In fact, 93% of patients suggested that a compassion deficit negatively impacted their quality of care (Trzeciak et al., 2017). Additionally, Freeman-Hildreth et al. (2018) found that provider compassionate communication improved coping ability of patients with Type II diabetes. Tierney et al. (2017) also found that the ongoing chronic care required for diabetics necessitated compassion to support patients through the variety of phases of their journey with their condition. In fact, non-compliance with treatments was seen as a barrier to provider

compassion from patients (Tierney et al., 2017). Compassion was also found to be foundational to patient centered care and positive response from patients across a variety of cultures (Singh et al., 2018). Gu et al. (2017) found that 71% of physicians surveyed responded that compassion could make a difference in patient outcomes. Therefore, exploration of the impact of provider compassion on patient adherence could add to the health services community knowledge of specific variables that enhanced provider communication and therefore, positive patient outcomes related to preventative care.

There was significant support in the literature for the use of the theory of planned behavior as a framework that described the influences on behavior choices. Thus, it appeared to be a valid choice as a framework to determine if provider compassion influenced the patient intention to complete cancer screening tests. The TPB suggested that three elements influenced intention and action; attitudes toward behaviors, subjective norms regarding that behavior and the perceived control over the behavior (Sussman & Gifford, 2019). Sussman and Gifford (2019) suggested that the model can be extended to a varied sequence of influences on the concept of intention and the eventual performance of the desired behavior. This application of TPB suggested that there is flexibility in the directional associations and could support the use of the TPB in the present study. As proposed, the researcher wanted to determine the extent that patient rated provider compassion had a relationship with patient adherence to prescribed cancer screening tests. For the proposed study, the patients rated their provider for their level of compassion during an outpatient clinic visit using the five-item compassion scale on the CG-HAPHS standardized tool. These provider compassion rating results were analyzed

and compared with the patient's electronic medical record, from which the adherence with the cancer screening tests was determined. Although there are three elements the TPB, this research focused on the compassion rating as an influence of the patient's attitude toward the behavior of the cancer screening test. The other key variables that were explored as an influence on the patient's attitude were patient gender and length of relationship with the provider. Additional variables for a future study could include, insurance status and history of past screenings to demonstrate other elements of the TPB that might influence intention. The author wanted to demonstrate a relationship between physician compassion and the patient having positive feelings toward pleasing their provider by adherence to their recommendation for colorectal cancer screening testing.

According to Hagger and Hamilton (2021) the most important factor in completion of a behavior was a person's stated intention to complete it. The feeling of intention had been described through the TPB as influenced by attitude toward the behavior, the individual norms about the particular behavior and perceived control over completing that behavior (Hagger & Hamilton, 2021). According to Sinclair et al. (2016), there was a relationship between a patient's feelings about the compassion of their provider and their likelihood to act on their prescribed treatment course. As a result, compassion of a provider could make a difference in a patient's intention to complete assigned tests. Although, there was support for the concept of patient provider relationships impacting quality of care in the literature, there was a gap in the literature specifically linking the aspect of patient-rated provider compassion to the patient completing assigned cancer screening tests. This study sought to inform that gap through

the use of TPB to establish that patient-rated provider compassion as a significant informant of the patient attitude and intention to complete prescribed cancer screening tests.

Chapter 3: Research Method

The purpose of this quantitative study was to examine the relationship between patient-rated provider compassion and patient compliance with prescribed colorectal cancer screening tests. Variables of interest in this study each supported important concepts that may influence the patient's intention to obtain their prescribed colorectal cancer screening test. Colorectal cancer is considered a preventable cancer because there are screening tests that can detect pre-cancerous polyps (Davidson, et al., 2021). Given, that colorectal cancer is the third most common cancer in the United States and this type of cancer had a success rate for cure if detected early, determining ways to increase adherence to colorectal cancer screening tests could add to positive patient quality and lives saved (Harber et al., 2021). The variables that were explored in this study include patient's rated physician compassion score, patient gender, and length of relationship with physician. Compassion appears to be an influential factor in patient adherence (Sinclair et al., 2016). Fuertes et al. (2017) also found that supportive and compassionate relationships between patients and providers led to improved patient outcomes. In addition, Laird and Raudonis (2020) found that there was a higher incidence of colorectal cancer in biological men as opposed to women. Gender has been extensively studied in a variety of care situations to evaluate the impact of patient gender on health behaviors. Although not a consistent finding for genders in terms of adherence, Benner et al. (2017) found that biological females exhibited a higher compliance with medications for diabetes. Whereas, Hussain et al. (2017) found that biological males had a higher compliance with exercise programs after myocardial infarction. These conflicting data

points suggested that patient gender could be an important issue to evaluate in looking at patient characteristics that drove adherence to assigned screening tests. Bussell et al. (2017) suggested that the longer a provider knows a patient, the higher likelihood the ability to develop trust and that trust would positively impact the patient's outcomes. Valery et al. (2020) also found an association between the number of primary care visits and the patient's uptake of prescribed cancer screening. Therefore, the variables I used in this study to explore the impact on patient adherence to colorectal cancer screening included the patient rating of a providers' compassion level, the compliance of that provider's patients with cancer screening tests, patient gender, and length of patient–provider relationship.

Research Design and Rationale

In this study, I employed the quantitative method to determine the relationship between patient-rated provider compassion and patient adherence with appropriate cancer screening tests. The specific cancer screening test selected was colorectal cancer screening because it applies to both males and females. This provided an opportunity to analyze the data to discern the potential impact of gender on the relationship. The independent variable was patient-rated provider compassion, and the dependent variable was patient compliance with prescribed colorectal cancer screening test. I also evaluated length of provider relationship for a mediating effect and patient gender for a moderating effect.

To address the research questions of this study, I used a quasi-experimental design, specifically a time sample approach. Campbell and Stanley (2015) suggested that

this type of design, specifically an equivalent time sample approach, is a common tactic used to collect two sets of measures to compare the effects of an experimental variable. This design applied to the two data elements included in the study: the five-item patient rated compassion index and the patient outcome of adherence to prescribed cancer screening tests.

To examine the relationship between variables, I employed regression analysis with both moderating and mediating variable examinations. This method was suggested based on the types of variables and desired outcomes to be explored through this study (see Pokhariyal, 2019). According to Pokhariyal (2019), the review of mediation and moderation could explain relationships and proportions of variance. The data from the Compassion Scale were continuous, and the data reflecting the patient adherence to their assigned cancer screening test were a binary value, which demonstrated the correct variable patterns for a logistical regression study (see Ranaganthan et al., 2017). The goal of this study was to determine the existence of relationships between patient rated provider compassion and patient adherence with prescribed cancer screening tests with the intervening variables of patient gender and length of relationship between provider and patient. According to Baron and Kenny (1986), behavioral intention is an example of a mediation relationship, and through examining the mediation effects of length of provider and patient relationship on patient-rated provider compassion and the outcome of compliance with prescribed cancer screening tests I sought to determine the impact of length of provider patient relationship on the independent and dependent variables. Baron and Kenny (1986) also described moderating variables as those that can affect the

direction or strength of the relationship and, to that end, gender was examined in the current study. Fang and Fang (2019) used a similar methodology to explore factors that affect patient satisfaction, using a multilevel regression analysis to investigate the various descriptive statistics that could influence patient satisfaction, which supported a similar choice in this study to evaluate variables that impact patient adherence to screening tests.

I used two secondary data sources in this study. Data were collected from the 24 hospital-based outpatient medical clinics where the general internal and family medicine faculty practice in a southern New Jersey health system. The two sources of data were EMRs to abstract the patients' adherence to their prescribed colorectal cancer screening test and the general internal and family medicine practice's patient satisfaction survey results (i.e., the CG CAHPS) to determine the internal and family medicine physician's scores on the five-item Compassion Scale. According to Roberts et al. (2019), this five-item patient rating of provider compassion was developed to provide a reliable measure of individual provider compassion and was added to the CG CAHPS survey used in the hospital-based outpatient medical practice study sites. I compared the de-identified secondary data from internal and family medicine provider compassion ratings by their individual patients with the companion secondary data of the same care provider's EMR records of completed cancer screening tests prescribed. The data points that were extracted from the secondary data sources included provider name, provider gender, existence of provider order for colorectal cancer screening, medical office in which patient saw the physician, date of service for patient visit, patient gender, patient age, patient overall physician communication rating of provider, patient overall rating of the

medical practice visit, patient rating of composite provider compassion (and the scores of individual questions from the five-item Compassion Scale include patient rating of how often do you feel your provider cares about your emotional or psychological well-being, how often do you feel your provider is interested you as a whole person, how often do you feel your provider is considerate of your personal needs, how often do you feel your provider is able to gain your trust, and how often do you feel your provider shows you care and compassion), and patient colorectal screening test compliance within the following 12 months from their earliest date of service within the calendar year of 2019.

Methodology

Population

The target population included all patients that had at least one office visit to primary care physicians that practice in the health system-owned offices during 2019 and met the range of target ages (i.e., between 49–75-years-old), which was the current guideline to have a colorectal cancer screening prescribed. The sample included males and females of all ethnicities, English speakers, and those that met and are above the target age of 49-years-old for colorectal cancer screening. The total population size using the criterion above was approximately 10,000 patients evaluated.

Sampling and Sampling Procedures

The exclusion criterion included patients that are 48 years of age and below as well as those visited other practice's locations that are not internal or family medicine physicians. I conducted an a priori power analysis for the study using the G*power software (see Faul et al., 2007). The effect size was estimated using two probabilities, Pr

(Y = 1 | X = 1) H_1 and Pr (Y = 1 | X = 1) H_0. Where Pr (Y = 1 | X = 1) H_1 represented the probability of a patient getting colorectal cancer screening when the patient-rated provider compassion score was one standard deviation score above the mean or .55 and where Pr (Y=1 | X=1) H_0 represented the probability of a patient getting colorectal cancer screening when the patient rated provider compassion score is at mean or .45. The Type 1 error rate was set at .05, and the power was set at .90. The Type 1 error rate is used to describe the scenario where the null hypothesis is true but incorrectly rejected (Hickey et al., 2018). I followed the usual significance level of .05 or a 5% chance that the results will be significant if the null hypothesis is actually true. The power was set at .9, which suggested that the likelihood of rejecting the null hypothesis when its incorrect was at 90% (see Perugini et al., 2018). The higher power level set for the study required a larger sample size, and this was aligned with the examination of secondary data. Hickey et al. (2018) suggested that if animal research was being conducted, a smaller sample might be in order to limit the sacrifice necessary to achieve a higher power for the study. The covariates are expected to have a low association with patient-rated provider compassion rating, and thus R = .2 and R-squared other X was .04. This assumption about a low association was based on the inconclusive role gender has played in similar studies as well as the lack of information regarding the association of length of relationship and patient outcomes. The X distribution was normal, and the sample size was set at 294. This sample of 294 provided a 90% chance of correctly rejecting the null hypothesis that patient-rated provider compassion was not associated with a patient receiving their prescribed colorectal cancer screening test.

Procedures for Recruitment, Participation and Data Collection (Archival Data)

I used two secondary sources in this study. Both were obtained from the hospital-based general internal and family medicine practice providers and included the EMR documentation regarding colorectal cancer screening and the general internal and family medicine practice's patient satisfaction survey results. According to Roberts et al., (2019) the five-item patient rating of provider compassion in the Compassion Scale was developed to measure individual provider compassion and was added to the CG-CAHPS survey previously used in the medical practice study site. I compared the de-identified secondary data from internal and family medicine providers individual compassion ratings by their patients with the companion secondary data of the same care provider's EMR records of completed cancer screening tests prescribed. Although I had access to this data due to my position in the study site institution, I submitted an application to the hospital's Institutional Review Board (IRB) to obtain access to the specific data required to perform the regression analysis.

Instrumentation and Operationalization of Constructs

The selected instrument for this study was the five-item Compassion Scale that is included in the CG-CAHPS survey administered by Press Ganey in outpatient medical practices. The validated five-item Compassion Scale and takes approximately 2–3 additional minutes to complete. The entire survey was sent out from Press Ganey within 48 hours of receiving notification of the patients' practice visit to all patients that visited the health system's outpatient medical practices, provided they have a mailing or email address available (Roberts et al., 2019). This series of questions provided an objective

measure of a patient's assessment of their provider's compassion (Roberts et al., 2019). Roberts et al. (2019) designed this five-item assessment to have a succinct method to ascertain a patient's perception of their providers' level of compassion during their office visit. The scores from this five-item instrument were shown to demonstrate a patient's impression of their physician's compassion and provided insight to determine if that assessment of compassion has an impact on the patient's behavior to follow that physician's instructions and prescribed follow-up measures. The CG-CAHPS had been confirmed as a consistent tool to provide information about the patient's experience with health services visits and has a reliability rating of Cronbach alpha = 0.88 (Roberts et al., 2019). The five-item Compassion Scale has also been validated through a factor analysis for each question included and an evaluation of the entire questionnaire using a confirmatory factor analysis with all standardize coefficients > 0.80, with its reliability measured by a Cronbach alpha of 0.94 (Roberts et al., 2019). The Compassion Scale provided consistent and reliable results in medical practice, inpatient hospital, and emergency room settings in urban and community hospitals (Roberts et al., 2021); therefore, I deemed it an appropriate measurement tool of physician compassion to include in this study.

The variables that I used in this study were the patient's perception of their provider's compassion, the patient's compliance with prescribed colorectal cancer screening, length of relationship with provider, and patient gender. The patient rating of provider compassion was based on the five-item Compassion Scale, which rates a provider's compassion through the use of five questions with a Likert style rating scale of

0 = *never*, 50 = *sometimes*, 75 = *usually*, and 100 = *always* (Roberts, et al., 2019). I analyzed the results of this ordinal rating scale in aggregate for each internal and family medicine provider to demonstrate the association of compassion with their particular panel of patients. The patients' compliance with their prescribed colorectal cancer screening tests was evaluated through a result recorded for the patient's prescribed colorectal screening test within the year after it was ordered by the internal or family medicine provider.

I obtained the nominal data by searching the EMR for patients that were associated with the specific internal and family medicine providers, then screening the patients by age category of 49–75-years-old, if they had completed a CG-CAHPS survey with the provider Compassion Scale, and if there was an order for a colorectal cancer screening test (i.e., visual exams or stool-based tests). The final component for this data point was the actual result of the prescribed test to demonstrate it was completed or not completed within the year after the order being entered or by April 2020.

The next variable to be explored was the length of the provider relationship with the patient. Trust is considered an emotion that is important in both quality communication and adherence with a physician's treatment plan, and it was suggested that trust takes time to develop (Ward, 2018). This time to develop trust was proposed as greater than a year of visits with the physician. For the purposes of this study, I assessed length of relationship on an interval scale by reviewing EMRs from 2019 retrospectively for 6 years prior to 2014 to establish if there was a visit between the internal medicine physician and patient in 2014. The EMRs were then searched for visits for each year (i.e.,

2015, 2016, 2017 and 2018) to determine when and if the initial visit occurred within 5-year time horizon. The patient's length of relationship with the physician was categorized into 5 years and greater (i.e., 2014 as an initial visit), 1–4 years (i.e., 2018, 2017, 2016 as an initial visit), and 1 year and less (2019 as an initial visit). Finally, the nominal variable of patient gender was defined as male, female, and unspecified as recorded in the patient's EMR.

Data Analysis Plan

The data analyses were performed with the latest version of statistical package for social sciences (SPSS) available (Version 28). The data were evaluated for the fields of interest to be properly assembled in the Excel file prior to being exported to SPSS. For the CG-CAHPS, each internal and family medicine provider was linked with their 2019 aggregate score from patient's visit during that year using the five-item composite scale. The EMR entries were coded with a record number in order to anatomize data for both the patient and the physician results as per the approval from the collaborating institution's IRB. The individual patient medical record number was linked to the individual internal and family medicine providers results so that the data were ready for analysis through SPSS. Other data fields that were also examined in this study include, the presence of a physician order for colorectal cancer screening in 2019, a result for this prescribed test by April 2020, patient gender, and patient visits to the provider retrospectively since 2014 to establish the length of relationship between patient and provider. These discrete data fields were reviewed prior to performing the next level of data analysis. If any of the variable fields are missing, the record was not included in the

analysis phase and the total number of records not included will be disclosed in the results section. When the study was completed, the database used to manipulate the data was deleted in order to add another measure of protection of the sensitive data used.

Research Questions and Hypotheses

RQ1: To what extent does patient-rated provider compassion have a relationship with patient adherence behavior for prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020?

$H_0$1: Higher ratings of provider compassion have no effect on patient adherence behavior for prescribed colorectal cancer screening tests

$H_1$1: Higher ratings of provider compassion impact patient adherence behavior for prescribed colorectal cancer screening tests

RQ2: What is the relationship between patient-rated provider compassion, length of provider–patient relationship, and patient adherence behavior to prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020?

$H_0$2: Higher ratings of patient-rated provider compassion and longer lengths of provider–patient relationships have no effect patient adherence behavior to prescribed colorectal cancer screening tests

$H_1$2: Higher ratings of patient-rated provider compassion and longer lengths of provider–patient relationships impact patient adherence behavior to prescribed colorectal cancer screening tests

RQ3: What is the relationship between patient-rated provider compassion, gender of the patient, and patient adherence behavior to prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020?

$H_0$3: Higher ratings of patient-rated provider compassion and patient gender have no effect with patient adherence behavior to prescribed colorectal cancer screening tests

$H_1$3: Higher ratings of patient-rated provider compassion and patient gender have a relationship with patient adherence behavior to prescribed colorectal cancer screening tests

Statistical Test

Given the binary description of the dependent variable of patient adherence to prescribed colorectal cancer screening tests, logistical regression was employed to test the hypotheses of interest in this study. The assumptions for this study adopt an epistemological approach that was objectivist in nature to determine a meaningful and objective outcome from the comparative variables (Al-Ababneh, 2020). The review of the data used a quantitative methodology that provided an independent means to evaluate the variables and postulated an objective review of the interrelation of the data points. Through incorporating a deductive process, there was an ability to evaluate the facts as they were presented in the data and then confirm the impacts and associations through experimentation and testing (Ryan, 2018). The assumptions were tested through the logistical regression test, with moderation used for patient gender and mediation used for

length of provider relationship. The choice of logistic regression was based on the binary nature of the dependent variable and the desire to create a grouping of independent variables that improved the likelihood of identifying the observed outcome (Stoltzfus, 2011). In fact, according to Stoltzfus (2011), the importance of the independent variables in this model was paramount and they must be based on prior investigations in order to ensure that their inclusion could support testing the hypotheses. Chi-square, as well as a Homer and Lemeshow tests were used for a goodness of fit for the model and a Bonferroni correction was run as appropriate to preserve Type I error of the null hypothesis actually being null with multiple outcomes of the designed study (VanderWeele & Mathur, 2019). The covariates were included to demonstrate an influence of patient gender, which continued to be an inconclusive metric in many health sciences research studies and length of relationship with the physician as a proxy variable for trust in the physician. Trust had been studied in context of colorectal cancer screening and had been suggested to be a variable that is additive to patient's adherence to a physician's treatment plan (Azulay et al., 2019). The results were reported in an odds ratio format in order to support ease of use and communication of the results.

Threats to Validity

External Validity

As internal and external validity were contemplated within a study design, there was a natural tradeoff between internal ability to assess cause and effect and external generalizability of results (Handley et al., 2018). External validity was described as the ability to generalize the results of the experiment outside of the study population

(Warner, 2013). Given the study population was a broad sample of primary care patients, a widely available rating scale of physician compassion was being used for assessment and all of the variables were being evaluated retrospectively, several threats to external validity were addressed through the experimental design. In fact, Handley et al. (2018) suggested that if an intervention was applied to an entire population, the application mimicked real world conditions and could enhance the ability to generalize results. The author argued that the study design and population evaluated and enhanced the generalizability of the study results.

Internal Validity

Since there were many methods to manage internal validity, in this study, sequencing of the variables examined was one technique employed. According to Warner (2013), experimental design could create the ability to suggest a cause-and-effect relationship. This causal relationship examined in a study may have assigned the cause preceding the outcome in question, which could be a method to accomplish internal validity. In this study, the rating of the physician's compassion, was evaluated prior to knowing if the patient completed their colorectal cancer screening test. Thus, supporting internal validity through the manner of creating the subsample to analyze. Another means of supporting internal validity, was to substantiate the causal association with a plausible theory to suggest a relationship could exist (Warner, 2013). For this study, the theory of planned behavior provided such a basis for connection of patient rated provider compassion and patient adherence to prescribed colorectal cancer screening. As the

theory suggested, intention was guided by attitudes about the behavior, subjective norms and perceived behavior control (Ajzen, 1985).

Construct Validity

Cronbach alpha analysis were contemplated to ensure validity and reliability of the surveys included in the research. Roberts et al. (2019) suggested that the five-item Compassion Scale measured the physician's ability to portray their compassion to their patients. This survey was independently deemed as a valid and reliable measure of patient rated compassion in order to determine if there is an association with the dependent variable outcome.

Ethical Procedures

The data were obtained by completing an IRB process through both Walden University and the collaborating institution. Since there was an inherent risk in all research for any participants, the study used de-identified data for both patient and physician results included in the analysis. This universal anonymity process for both physician and patient data minimized the ethical concerns that could be raised through comparing individual patient ratings of compassion for their physician and any resulting hard feelings from knowing individual patient rated physician compassion ratings as well. The IRB application for the collaborating institution was filed first, as they were the IRB of record since the data were housed and owned by that institution. Once the approval of the application and the data worksheet came from the collaborating institution IRB protocol 22-132, Form B was filed through Walden University's IRB and they also provided approval (07-26-22-0985070). After a thorough review, both institutions

considered this study limited risk and provided a path for expedited review through the collaborating institution and Walden University.

Summary

After an evaluation of substantial literature and research techniques, the quantitative model selected for this study appeared to provide the best method. A quasi-experimental design, that is, a design with no experimental control group, provided an adequate opportunity to control the variables involved. Although the study did not provide an opportunity for the deidentified participants involved, to be randomly assigned to conditions for comparison. The survey instruments that were included in the study have been tested for validity and reliability (Roberts, et al., 2019). The use of logistic regression analysis, supported the planned research outcome of an association between patient rated provider compassion with adherence to prescribed colorectal cancer screening tests due to the type of dependent variable involved and the ability to use individual patient level data. External validity might be difficult to achieve given other influences on the outcome of adherence to colorectal cancer screening, however the research could add to the body of knowledge about the nuanced impact of physician compassion on the behaviors of their patients.

Chapter 4: Results

The purpose of this quasi-experimental research study was to determine the relationship between patient-rated provider compassion and patient adherence to colorectal cancer screening. The following research questions and associated hypotheses guided this study:

RQ1: To what extent does patient-rated provider compassion have a relationship with patient adherence behavior for prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020?

$H_0$1: Higher ratings of provider compassion have no effect on patient adherence behavior for prescribed colorectal cancer screening tests

$H_1$1: Higher ratings of provider compassion impact patient adherence behavior for prescribed colorectal cancer screening tests

RQ2: What is the relationship between patient-rated provider compassion, length of provider–patient relationship, and patient adherence behavior to prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020?

$H_0$2: Higher ratings of patient-rated provider compassion and longer lengths of provider–patient relationships have no effect patient adherence behavior to prescribed colorectal cancer screening tests

$H_1$2: Higher ratings of patient-rated provider compassion and longer lengths of provider–patient relationships impact patient adherence behavior to prescribed colorectal cancer screening tests

RQ3: What is the relationship between patient-rated provider compassion, gender of the patient, and patient adherence behavior to prescribed colorectal cancer screening tests among southern New Jersey primary care patients in 2019–2020?

$H_0$3: Higher ratings of patient-rated provider compassion and patient gender have no effect with patient adherence behavior to prescribed colorectal cancer screening tests

$H_1$3: Higher ratings of patient-rated provider compassion and patient gender have a relationship with patient adherence behavior to prescribed colorectal cancer screening tests

In this chapter, I provide the findings of the analysis conducted to answer each of the research questions. The data sample is described and the covariates are explained in relation to the variety of analyses performed. The variations between the methodology suggested in Chapter 3 and the actual analyses performed are also outlined to provide the rationale for any variation. I obtained the data from a de-identified caboodle database where the collaborating institution's patient-rated provider compassion responses on the CG-HAPHS survey were housed. These data were compared to the collaborating institution's EMRs that supplied the documentation for the patient's length of relationship with their provider, presence of an order for colorectal screening, evidence of completion for the colorectal cancer screening order, and patient gender. The collaborating institution's IRB review provided me with an updated data collection worksheet from the initial data elements that were outlined in Chapter 3. The

collaborating institution IRB suggested an additional level of privacy for the physician data included in the data set and requested that both the patient information as planned in Chapter 3 and the associated patient-rated physician Compassion Scale results be de-identified. This was completed by the medical informatics and business intelligence teams at the study prior to being shared with me for analysis.

Data Collection

I obtained the secondary data for this study from survey respondents to the CG-CAHPS who visited family practice or internal medicine, hospital-based, medical practice clinics in southern New Jersey during 2019. The data were derived from visits to 24 clinics and 58 physicians from April 2019–December 2019. The total completed primary care visits during that time period were 106,968. The data plan that I established in Chapter 3 was based on having access to the entirety of the 2019 data; however, the Compassion Scale was added in April 2019, so the data plan was modified to include only primary care clinic visits between April–December 2019 in the analysis. I then screened the data for patients aged 49–75, which represented the age-based screening guidelines for colorectal cancer screening at the time of this study. With this additional data screening criterion added, I then rescreened the data for returned CG-CAHPS surveys. The study site health system usually has return rates for CG-CAHPS surveys that are approximately 11.5%. This additional criterion pared the sample size down to 5,718 age-appropriate patients with a primary care visit who had returned CG-CAHPS surveys. This return rate was similar to the health systems' average return rate. The next criterion that was applied to the data was the evidence of colorectal cancer screening

orders placed by the internal medicine or family medicine physician during their April–December 2019 visit. This last screening element for the data yielded the final data sample of 488 patients.

Table 1 demonstrates the sample's descriptive statistics of average relationship length, average composite Compassion Score, and average age. Table 2 demonstrates the breakdown of colorectal cancer screening completion. With 488 total entries in the sample, 357 completed colorectal cancer screening orders and 131 orders that were not completed. This result yielded a 73.2% screening compliance rate, which was higher than the published national statistics for the general public's compliance with colorectal cancer screening.

Table 1

Descriptive Statistics: Original Sample

	N	*M*	*SD*
Relationship length	488	2.4	.763
Group composite compassion score	488	94.2	13.2
Age	488	63.03	7.4

Table 2

Order Completion: Original Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No screening	131	26.8	26.8	26.8
	Screening	357	73.2	73.2	100
	Total	488	100	100	

In Table 3, the gender breakdown revealed that 295 subjects were female and 193 were male, which is consistent with the customary gender breakdown for those that answer patient satisfaction surveys at the collaborating institution. As stated in Table 2, the average age of the total sample was 63, with the age range between 49 and 76 and a standard deviation of 7.4 years; this average age is consistent with the published averages of those who are compliant with colorectal cancer screening. The above sample characteristics support generalizability to the population at large and are consistent with principles to enhance external validity.

The covariates included in the study represent patient gender, patient-rated compassion composite score, and length of patient-provider relationship. Figure 1 represented the distribution of compassion Composite Scores, demonstrating that the average score for the sample was 94.23. Table 4 described the length of relationship breakdown within the sample, 57.4% of patients having more than a 4-year relationship with their provider, 25.6% of patients having a relationship that ranged from 1 - 4 years, and finally those that are less than a year, represented 17% of the sample. The covariates outlined variables that might affect colorectal cancer screening.

Table 3

Gender Distribution: Original Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	290	59.4	59.4	59.4
	Female	198	40.6	40.6	100
	Total	488	100	100	

Figure 1

Compassion Composite Score Distribution: Original Sample

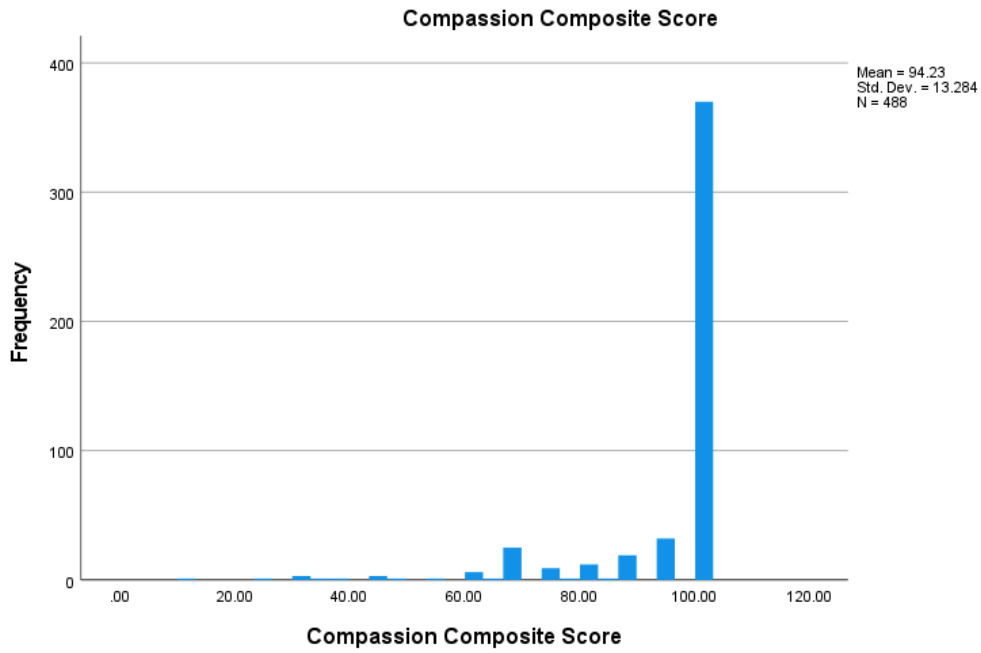

Table 4

Length of Relationship: Original Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 year and less	83	17.0	17.0	17.0
	1–4 years	125	25.6	25.6	42.6
	4 years and greater	280	57.4	57.4	100
	Total	488	100	100	

Study Results

I performed a binary logistic regression analysis to answer the first research question regarding the impact of patient-rated provider compassion on a patient's completing colorectal cancer screening. The outcome variable of colorectal cancer screening completion was coded 0 = not completed and 1 = completed. The predictor variable included in the model was the response to a survey question regarding patient-rated provider compassion. In the SPSS data file, the variable of patient-rated provider compassion was represented by a composite compassion score that converted the five answers to a 0–100 scale and then averaged those answers to achieve a numerical composite compassion score for each patient's response. This methodology provided a mean score of 94.2 for total compassion composite. I used the binary logistic regression procedure in SPSS 28 to perform the analysis on the data from the 488 cases included in the dataset.

I performed a test of the full model (with composite compassion score as the predictor variable) instead of a constant only or null model, and the results were not statistically significant, X^2 (1) = 0.334, p = .563 (Table 5). The strength of the explanation of variance of the compassion score and whether colorectal cancer screening was completed was extremely low because the Cox and Snell's R^2 = .001 and Nagelkerke's R^2 = .001. The Hosmer and Lemeshow test indicated that there was adequate fit for the model because the p value > .05 at (p = .325).

Table 5

Omnibus Tests of Model Coefficients: Original Sample

		Chi-square	*df*	Sig.
Step 1	Step	.334	1	.563
	Block	.334	1	.563
	Model	.334	1	.563

Table 6

Variables in Equation: Original Sample

		B	S.E.	Wald	*df*	Sig.	Exp (*B*)	95% C.I. UL	LL
Step 1	Compassion score	.004	.007	.341	1	.559	1.004	.990	1.019
	Constant	.594	.706	.707	1	.400	1.810		

Table 6 contains a summary of the binary logistic regression coefficients and Wald statistic results. Based on these results, Wald = .341 and $p = .559$, the model did not statistically demonstrate that patient-rated provider compassion made a statistically significant difference on patient adherence to their colorectal cancer screening test. There was also only a slight increase, 1.004 times higher odds, for those patients who rated their provider with higher compassion to have, in turn, completed their colorectal cancer screening test. The confidence interval also included one within the range at 95% (.990–1.019), which demonstrated another indication that the null hypothesis failed to be rejected. Therefore, there was not enough evidence from this analysis to reject the null hypothesis for RQ1.

I anticipated using a binary logistic regression to address RQ2, which explored the relationship between patient-rated provider compassion and length of provider patient

relationships with their impact on patient adherence behavior to prescribed colorectal cancer screening tests. The planned analysis was a logistic regression with mediation; however, mediation analysis required the path of variables between patient-rated provider compassion and patient adherence to colorectal cancer screening to demonstrate statistical significance. Therefore, this analysis could not be completed because the initial analysis that evaluated patient-rated provider compassion and patient adherence to colorectal cancer screening yielded $p = .559$. The null hypothesis for RQ2 could neither be rejected nor accepted because the original pathway between patient-rated provider compassion and patient adherence with prescribed colorectal cancer screening was found not to be statistically significant.

I performed a binary logistic regression with moderation to address RQ3. The outcome variable for analysis was patient adherence to prescribed colorectal cancer screening. The predictor variable for the analysis was patient-rated provider compassion, and the moderator variable was gender. As described in Table 7, the interaction between patient adherence to prescribed colorectal cancer screening and patient gender was found not to be statistically significant [$B = -.011$, 95% CI (.990, 1.019), $p > .05$]. The conditional effect of patient-rated provider compassion on patient adherence to prescribed colorectal cancer screening showed corresponding results. These results indicate that gender was a non-moderator of the relationship between patient-rated provider compassion and patient adherence to prescribed colorectal cancer screening tests.

Table 7

Moderation Coefficients: Original Sample

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	St. Error	Beta	*t*	Sig.
1	(Constant)	.657	.145		4.528	<.001
	INT	-.011	.020	-.025	-.549	.584
	Compassion composite score	.001	.002	.024	.520	.603

Note. Dependent variable = order completion. INT= Interaction term patient gender and patient rated provider compassion

I completed further analysis, in the form of a post hoc analysis, to dive deeper into the data. In the original analysis, I assumed that the study sample's dependent variable would have a normal distribution of patients who completed their colorectal cancer screening and those that did not complete their colorectal cancer screening. Upon examination of the initial sample distribution, there was an imbalanced sample that demonstrated 72% of all patients included in the 488 had completed their colorectal cancer screening. Since this distribution was imbalanced according to the reported U.S. patient colorectal cancer screening completion rates, I applied a bootstrapping process to the compliance group within the dependent variable to ascertain if a more normally distributed population would impact the strength of the relationship between patient-rated provider compassion and patient adherence to prescribed colorectal cancer screening. The bootstrapping process included running a randomization of the sample of the patients that had received their colorectal screening approximately 20 times to randomly include certain records from the original sample to balance the distribution.

I performed a binary logistic regression analysis with a bootstrapped subset of the original sample of 488 patients. As described in Table 8, this subset sample included a total of 298 patients, of which 167 completed their prescribed colorectal cancer screening and the same group from the initial sample that did not complete their colorectal cancer screening at 131.

Table 8

Order Completion: Bootstrapped Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not completed	131	44.0	44.0	44.0
	Completed	167	56.0	56.0	100.0
	Total	298	100.0	100.0	

The post hoc analysis of research question one resulted in a statistically significant result as described in Table 9. A test of the full model (with composite compassion score as the predictor variable) compared with a constant-only or null model was statistically significant, $X^2 = 4.326$, $p = .038$. The strength of the explanation of variance of the compassion score and whether colorectal cancer screening was completed was low as the Cox and Snell's $R^2 = .014$ and Nagelkerke's $R^2 = .019$. The Hosmer and Lemeshow Test indicated that there was adequate fit for the model as the p value > .05 at ($p = .139$).

Table 9

Omnibus Tests of Model Coefficients: Bootstrapped Sample

		Chi-square	*df*	Sig.
Step 1	Step	4.326	1	.038
	Block	4.323	1	.038
	Model	4.326	1	.038

Table 10

Variables in the Equation: Bootstrapped Sample

		B	S.E.	Wald	*df*	Sig.	Exp(B)	95% C.I.	
								LL	UL
Step1[a]	Compassion Composite Score	.022	.011	4.161	1	.041	1.022	1.001	1.043
	Constant	-1.81	1.015	3.185	1	.074	.163		

[a]Variable entered on step 1: Compassion Composite Score

Table 10 summarized the binary logistic regression coefficients and Wald statistic. Based on these data, W = 4.161 and p = .041, the bootstrapped model demonstrated statistical significance that patient rated provider compassion made a significant difference on patient adherence to their colorectal cancer screening test. There was also a slight increase, 1.022 times higher odds, for those patients who rated their provider with higher compassion to have completed their colorectal cancer screening test. The confidence interval was above one with the range at 95%, (1.001-1.043), which demonstrated an indication that the null hypothesis should be rejected. Therefore, there seemed to be evidence to suggest acceptance of the alternative hypothesis for research

question one, which stated that higher ratings of provider compassion might have an impact on patient adherence behavior for prescribed colorectal cancer screening tests.

Summary

A logistic regression analysis was performed on 488 patients to determine if patient rated provider compassion had a relationship with patient adherence for prescribed colorectal cancer screening tests. RQ1 suggested as the alternative hypothesis that higher ratings of provider compassion impact patient adherence behavior for prescribed colorectal cancer screening tests. This hypothesis was rejected as $p = .559$ and the null hypothesis of higher ratings of provider compassion have no effect on patient adherence behavior for prescribed colorectal cancer screening tests. The RQ2 posited the relationship between patient-rated provider compassion, length of provider patient relationship and patient adherence behavior to prescribed colorectal cancer screening tests. This analysis planned to use length of patient provider relationship as a mediating variable, however it was not able to be conducted due to the pathway related to patient-rated provider compassion and patient adherence to colorectal cancer screening not having a statistically significant relationship. Thus, the alternative and null hypotheses related to the impact of patient rated provider compassion and longer lengths of provider patient relationships could not be explored. RQ3 evaluated the relationship between patient-rated provider compassion, gender of the patient and patient adherence behavior to prescribed colorectal cancer screening tests. A moderation analysis was performed to examine if patient gender had any relationship with patient rated provider compassion and the adherence to colorectal cancer screening. The interaction between patient

adherence to prescribed colorectal cancer screening and patient gender was found not to be statistically significant [B = -.011, 95% C. I. (.990, 1.019), p >.05]. Therefore, the null hypothesis of higher ratings of patient rated provider compassion and patient gender have no effect with patient adherence behavior to prescribed colorectal cancer screening tests must be accepted.

The initial data analysis demonstrated through the tests performed, that a post hoc analysis could be useful in fully understanding the data sample. This additional analysis specifically evaluated RQ1 through a bootstrapping technique that balanced the initial sample to normal distribution of those who completed colorectal cancer screening and those who did not complete the screening. This analysis demonstrated statistical significance that patient-rated provider compassion made a significant difference on patient adherence to their colorectal cancer screening test p = .041. Thus, with a bootstrapped sample of 298 patients who were normally distributed between those who received colorectal cancer screening tests and those who did not, the alternative hypothesis of higher ratings of provider compassion impact patient adherence behavior for prescribed colorectal cancer screening tests could be accepted. Additional discussion of these findings will be discussed further in Chapter five

Chapter 5: Discussions, Conclusions, and Recommendations

In this chapter, I discuss the outcomes of the study as they relate to the relevant literature, the limitations of the study, the recommendations for future contemplation, and implications for social change. In this quantitative, quasi-experimental study, I determined the relationship between patient-rated provider compassion and patient

adherence with their prescribed colorectal cancer screening. Colorectal cancer was the second leading cause of cancer death in the United States at the time of this study. (Ladabaum et al., 2020). Thus, determining effective contributing factors to inspire early detection could positively impact general health care quality. Physician compassion could be one of those important elements in patient decision making regarding cancer screening completion. Huei-yu Wang et al. (2018) found that patients were influenced by physician communication about adherence to preventative cancer screening. In this study, I sought to address a gap in the literature regarding the element of physician compassion and whether that impacted patient adherence with colorectal cancer screening tests. Other variables explored were provider–patient length of relationship and patient gender.

I used existing data sets for this analysis, including respondents to the CG-CAHPS survey and comparison of those respondents linked EMR data to ascertain if the patient had completed their colorectal cancer screening. The outcome variable was whether the patient had completed colorectal cancer screening. The primary predictor variables were patient-rated provider compassion, patient gender, and patient physician length of relationship. The results of the study demonstrated that the initial sample revealed no impact of patient-rated provider compassion, gender, or length of provider–patient relationship on patient adherence behavior to prescribed colorectal cancer screening tests. Since the data set did not follow the expected population distribution for colorectal cancer screening completion, I conducted a bootstrapping analysis on the completion subset of the initial patient sample of 488 to determine if normalization of the completion rates would impact the significance of the results. The data sample had a high

rate (72%) of patients who had completed their colorectal cancer screening, so a post hoc analysis was run to evaluate a normalized distribution for patients' completion and determined a statistically significant result of $p = .041$.

Interpretation of the Findings

The high average patient-rated provider compassion score (94.23), the moderate length of relationship average at 2.4 years, and the very high overall compliance rate for colorectal cancer screening (72.3%) for this sample provided a different starting point for the analysis then was originally expected. According to Roberts et al (2019), 71.3% of the patients included in the original study rated their provider with a 100% compassion score, meaning that the patients rated their provider with the *always* category for the five-item Compassion Scale. In this study, 75.8% of the patients in the 488-person sample rated their provider with a perfect (100%) compassion score. This high baseline compassion score among the patient sample, combined with the high compliance rate for colorectal cancer among the patient sample (72.3%), created a sample in which statistical significance may have been difficult to discern. The National Cancer Institute (2022) suggested that U.S. compliance with colorectal screening rates for 2019 were on average 68%. Peterson (2021) described several normalization techniques that could be employed with a similar covariate distribution to the study data set and suggested that the results may appear entirely different. Pons (2007) suggested that bootstrapping might be a technique to use to provide a suitable sample estimate for resampling within a nonnormalized data set.

The results found seemed incongruent with the prevailing literature related to the covariates of interest in this study. Hesse and Raucher (2019) suggested that augmented quality of care from adherence to screening behaviors could be achieved through compassionate provider-patient relationships. Singh et al. (2018) supported that claim through findings related to increased patient compliance if the patient considered the physician compassionate. Valery et al. (2020) also found that the number of visits to the patient's primary care physician positively impacted patient adherence to colorectal cancer screening. All these studies from the literature review in Chapter 2 supported the hypotheses in the two research questions that addressed how physician compassion and length of relationship with the physician impacted patient compliance behavior. The variable of gender was ambiguous in the literature because an effect was not detected universally. Mehra and Mishra (2021) found a female patient impact with higher degree of communication, whereas Fortuna et al. (2018) found that gender had no impact on adherence and patient satisfaction. Thus, the findings in the current study were aligned with the findings in the literature of no statistically significant impact from a gender perspective on adherence to prescribed treatments from a physician.

According to the TPB, the intention to complete a behavior can be influenced through perceived behavioral control, attitude toward performing the behavior, and subjective norms around the behavior (Ajzen, 2020). The results of the current study might suggest that the study population had a high degree of perceived control over behavior accomplishment as evidenced by the high completion rate for colorectal cancer screening. This result was consistent with other cancer screening studies where the TPB

was applied, including in mammography and cervical cancer (Mirzaei-Alavijeh et al., 2018; Roncancio et al., 2015). Thus, high behavioral control as a key variable to adherence was an important finding in the study.

Limitations of the Study

A limitation that was described in Chapter 1 was that the sample may have been unbalanced due to too many responses received for one physician that may have skewed the compassion results and impacted the external validity of the study. The actual limitation that was uncovered through the study related to the number of perfect scores given by patients within the sample. Out of the sample, 75.8% of the patients gave a perfect score (100%) to their physician, whereas the original study from 2019 demonstrated 71.3% of patients gave a perfect score to their physician. This increase in the overall compassion score could be a limitation for generalizability to those outside of internal medicine and family practice specialties and outside the hospital-owned practice at the study site.

Another limitation discussed in Chapter 1 was the impact of COVID-19 elective procedure shut down for colonoscopies during the study period. This limitation was founded because the study period was limited to April–December 2019 for patients having their initial visit to a primary care physician as part of the inclusion in the study data. This was due to the Compassion Scale being added to the CG-CAHPS in April 2019. The decline attributed to COVID-19 has been deemed profound, particularly in colorectal cancer screening (Chen et al., 2021). This effect, although minimal in the study data due to the higher than national average results of screening found in the original

sample, could have had an impact on even more patients obtaining their colorectal cancer screening. Chen et al. (2021) also found that the northeastern United States had a more significant influence of this COVID-19 effect. Since the study was conducted in the northeastern United States, it seems that this limitation presented a significant challenge to the overall integrity of the data. Since the results of the current study were counter to those in the literature, there may be a need to evaluate the study sample to perhaps normalize the data for those patients who completed their colorectal cancer screening. Although insurance status was not a covariate of interest, Zhao et al. (2018) found that insurance status does affect uptake to cancer screening tests. The insurance status of participants may have also affected the current study sample.

Recommendations

There could be an opportunity to replicate this study in a time period that does not include the COVID-19 pause of elective testing to increase the generalizability of the colorectal cancer screening rates. These rates, although high for this study sample, could have been even higher if not negatively impacted by the COVID-19 shutdown. Another recommendation would be to focus the covariate analysis on number of visits to the primary care physician instead of length of relationship. This measure was found in the literature related to colorectal cancer screening and could be a more accurate predictor variable for colorectal cancer screening completion (Valery et al., 2020). Additionally, examining each individual question of the five-item Compassion Scale for their impact on colorectal cancer screening, instead of evaluating a composite score of all of the questions, may have provided more precise impact effects of the aspects of provider

compassion. Finally, insurance status may be another aspect to explore in future studies to determine the influence on colorectal cancer screening.

Implications

Although the study did not result in statistically significant results between patient-rated provider compassion and patient adherence to prescribed colorectal cancer screening, the findings remained encouraging on an individual level to create positive social change. According to the TPB, individual behavioral control is a key element in patients adhering to assigned cancer screening tests (Mirzaei-Alavijeh et al., 2018). That finding was supported through this study, which adds to the body of knowledge regarding patients in a supportive care relationship did take positive action to complete assigned screening tests. This finding is important for health systems because they work with their providers and patients. For providers, a supportive care environment that focused on patient action led to 72.3% of patients obtaining a life-saving cancer screening. For patients, the importance of their intention to complete colorectal cancer screening was confirmed.

Conclusion

Colorectal cancer was the focus of this study because it is one of the most treatable cancers with early detection (see Laird et al., 2020). I conducted this study because the determination of associated factors that can positively impact a patient's likelihood of compliance with colorectal cancer screening would lead to positive social change through increasing the overall quality of health care. A compassionate and supportive relationship with a physician has been studied as key impactful element

affecting screening compliance. This supportive relationship is built over time and, therefore, I explored the length of the patient–provider relationship and provider compassion to determine if these elements had an association with patient adherence to colorectal cancer screening. In addition, gender was explored as another variable of interest.

Although patient-rated provider compassion and length of patient provider relationship did not statistically significantly impact adherence to colorectal cancer screening, the 75.8% perfect provider compassion scores and the 73.2% adherence to colorectal cancer screening pointed to a supportive care environment being a critical factor for patients who took direct action to support their personal health. This finding was important and reinforces messages for providers and health systems about the importance of a supportive physician–patient relationships. Health system promotion of compassionate physician communication and relationships with their medical practice patients can positively impact patient quality outcomes. Ladabaum (2020) suggested that 46%–63% less deaths might have occurred if people received timely colorectal cancer screening. The study finding that an affirmative care environment was shown to be another key to supporting positive patient action regarding their disease prevention activities. Positive social change and the saving of lives can be achieved through the establishment of one positive patient–provider relationship at a time.

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