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The Relationship Between Advanced Payment Model Providers and Patient Behavior

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This is to certify that the doctoral dissertation by

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has been found to be complete and satisfactory in all respects,
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Walden University
2021

Abstract

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by

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MPA, Western Michigan University, 2001

BS, Western Michigan University, 1997

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

May 2021

Abstract

Public health initiatives include vaccination and screening efforts to reduce the burden of disease. This study addressed colorectal cancer (CRC) screening behaviors of accountable care organization (ACO) patients with different social determinants of health and providers' ability to comply with the Medicare Shared Savings Plan (MSSP) quality measure ACO #19. This study followed the socioecological model and a cross-sectional quantitative design to assess data from the MSSP public use file 2019 across three manuscripts to expand on current literature. The purpose was to determine whether patient behavior was the primary driver to improve healthcare quality. Study results showed that performance rates increased in ACOs that had a greater number of patients. ACOs with more non-White patients and more Medicaid patients were less successful with CRC screening. Performance was highest when more patients were between 65-85 years of age as compared to patients under 65 or over 85 years old. The implications for positive social change in this study include data for policy makers, health, and public health care professionals to reduce disparities for CRC screening and incidence of CRC among vulnerable populations. The data also support population health initiatives beyond CRC-related illness.

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Dedication

I dedicate this dissertation to my wife, mother, brother, sister, and late father. Your love and support are my inspiration for social change. I dedicate this work to my teachers, coaches, and professors for grounding me with a work ethic that was invaluable during the dissertation process. Lastly, I dedicate this work to the members of my diversity, equity and inclusion resource group and all aspiring change agents focused on making health and wellness equitable and inclusive.

Acknowledgments

I acknowledge my family by blood and other for their outstanding support, motivation, and encouragement. I acknowledge the faculty and staff of Walden University who guided me on my doctoral journey. A humble thank you to my chairperson Dr. Jeanne Connors and committee member Dr. Peter Anderson for your relentless support. Lastly a special thank you to my URR Dr. Vasileios Margaritis for your expertise and guidance to complete my journey.

Table of Contents

List of Tables vii

List of Figures viii

Part 1: Overview 1

Introduction 1

Problem 3

Contribution to Social Change 3

Background 4

Key Variables and Alignment 7

Conceptual Framework 9

Overview of the Manuscripts 10

Manuscript 1 11

Manuscript 2 13

Manuscript 3 14

Significance 16

Policy 17

Social Change 18

Summary 19

Part 2: Manuscripts 20

The Relationship Between Advanced Payment Model Providers and Patient Behavior: Practice Size and Provider Influence on Patient Behavior 20

Outlet for Manuscript 21

Abstract 22

Introduction 23

Problem 23

Significance of the Study 24

Framework 26

Background 27

Research Questions and Design 32

Methods 33

Operational Definitions 33

Bias and Limitations 33

Scope and Delimitations 34

Design 35

Instrumentation 35

Participants 36

Data Sources 36

Results 37

Execution 37

Descriptive Statistics for all ACOs 38

Tests of Assumptions 40

Inferential Statistics Manuscript 1 41

Linear Regression 43

Discussion 44

Interpretation 44
Interpretation in the Context of the Socioecological Model 45
Limitations 46
Implications 46
Recommendations 48
Conclusion 49
References 52
Provider Influence on Patient Behavior Related the Population's Race, Age, and Gender 64
Outlet for Manuscript 65
Abstract 66
Introduction 67
Problem 67
Significance of the Study 68
Framework 69
Background 71
Research Question and Design 75
Methods 76
Operational Definitions 76
Bias and Limitations 77
Scope and Delimitations 77
Design 78

Instrumentation 78
Participants 79
Data Sources 80
Results 80
Execution 81
Descriptive Statistics for all ACOs 82
Tests of Assumptions 84
Inferential Statistics Manuscript 2 85
Linear Regression 88
Discussion 89
Interpretation 89
Interpretation in the Context of the Socioecological Model 90
Limitations 91
Implications 92
Recommendations 93
Conclusion 94
References 97
Provider Influence on Patient Behavior Related to Population Insurance Coverage 110
Outlet for Manuscript 111
Abstract 112
Introduction 113

Problem 113
Significance of the Study 114
Framework 116
Background 117
Research Question and Design 122
Methods 123
Operational Definitions 123
Bias and Limitations 124
Scope and Delimitations 124
Design 125
Instrumentation 125
Participants 126
Data Sources 127
Results 127
Execution 128
Percent of Medicaid Patients 128
Descriptive Statistics for all ACOs 129
Tests of Assumptions 130
Inferential Statistics 131
Linear Regression 133
Discussion 133
Interpretation 133

Interpretation in the Context of the Socioecological Model 134
Limitations 135
Implications 135
Recommendations 137
Conclusion 138
References 141
Part 3: Summary 154
Integration of the Studies 154
Conclusion 155
References 158

List of Tables

Table 1. Variables and Statistical Tests Used to Evaluate Research Questions 38

Table 2. ACO #19 Performance Range and Frequency..... 39

Table 3. Range and Frequency of Primary Care Providers in ACOs 39

Table 4. Range and Percentage of Attributions Across All ACOs 40

Table 5. Range and Percentage of Attribution..... 40

Table 6. Correlation Between ACO #19 Performance and Practice Size..... 43

Table 7. Variables and Statistical Tests Used to Evaluate Research Questions 82

Table 8. ACO #19 Performance Range and Frequency..... 82

Table 9. Range and Frequency of Primary Care Providers in ACOs 83

Table 10. Range and Percentage of Attributions Across all ACOs 84

Table 11. Range and Percentage of Attribution..... 84

Table 12. Correlation Between Attribution Age and Performance..... 86

Table 13. Correlation Between Attribution Race and CRC Screening..... 88

Table 14. Variables and Statistical Tests Used to Evaluate Research Questions 128

Table 15. ACO #19 Performance Range and Frequency..... 129

Table 16. Range and Percentage of Attribution Across all ACOs..... 129

Table 17. Range and Percentage of Attribution..... 130

Table 18. Correlation Between Medicaid and ACO #19 Performance**……...**130

List of Figures

Figure 1. Normal Q-Q Plot for ACO #19 Performance 41

Figure 2. ACO Practice Size Attribution 42

Figure 3. Normal Q-Q Plot for ACO #19 Performance 85

Figure 5. Normal Q-Q Plot for ACO #19 Performance 131

Figure 6. ACO #19 Score and percent of Medicaid 132

Part 1: Overview

Introduction

Health care delivery and public health have overlapping goals to improve health outcomes in their communities through vaccination and screening. The paths toward these goals are influenced by factors like policies, funding sources, and external demands that guide community-based organizations' and health care and public health organizations' decisions (Cunningham et al., 2020). To address rising healthcare costs in the United States (Shrank et al., 2019) as well as significant disparities in health outcomes across the population (Foo et al., 2017), public, community, and clinical health professionals in several communities have partnered to form organizations designed to improve public health by addressing social determinants of health and influencing individual behavior (Bachrach et al., 2016; Noble et al., 2014). For example, the Institute of Healthcare Improvement's Quadruple Aim outlined a framework to improve health outcomes, lower healthcare costs, improve patient experience, and improve clinician satisfaction (Wagner et al., 2018). Experimental alternative payment delivery models (APM) were created with varying success to influence components of the Quadruple Aim (Noble et al., 2014).

Additionally, population engagement can lead to behaviors that result in healthier outcomes, which may also reduce the overall cost of care (Grand et al., 2014; Simmons et al., 2014). Two population-based behaviors intended to reduce the burden of disease include vaccinations and screenings (Siewert et al., 2020). Over 34,000 Americans died from influenza during the 2018–2019 influenza season, which included nearly 500,000

hospitalizations and an estimated 35.5 million people who became sick; however, the general rate of behavior adoption for influenza vaccinations in the United States is less than 50%, with rates among people aged 65 year and older approximately 65% (Centers for Disease Control and Prevention [CDC], 2019). But physicians are often the first line of defense to promote the behaviors that influence public health (Redwood et al., 2016).

Another example of population-based behavior is colon cancer screening. In 2016, colorectal cancer (CRC) was the third leading cancer diagnosed for U.S. citizens, excluding skin cancers, with an estimated 40,000 deaths attributed to colon cancer (Bachman et al., 2018). Individuals who are overweight, use alcohol, smoke, practice risky sex, and are physically inactive are at higher risk of CRC (Bachman et al., 2018). These risks are influenced by individuals' behavior; however, CRC screening can provide early identification of CRC and improve health outcomes (Bachman et al., 2018). But there are significant differences in CRC screening rates across, racial, and sociodemographic populations (Bachman et al., 2018). Cancer screening rates have also declined due to the COVID-19 pandemic especially for minority populations, which is expected to lead to increase cancer for all populations (Carethers et al., 2020). Before the pandemic, physicians enrolled in accountable care organizations (ACOs) were measured on the success rate of CRC screening for their patients through the performance measure ACO #19 of the standards of the Medicare Shared Savings Plan (MSSP) for CRC Screening (Smith et al., 2019). Medicare recognized four methods of CRC screening that vary in complexity and invasiveness: fecal immunochemical test, fecal occult blood test, multitarget stool DNA test and colonoscopy (Smith et al., 2019).

Problem

Health care delivery and public health have overlapping efforts like health screening activities to lower the burden of disease (Cunningham et al., 2020). Though patient behavior is the key to improve quality and health outcomes, there are barriers to influence individual behavior (Morge et al., 2019). Moreover, there are disparities in compliance among people with health behavior recommendations based on factors like age, gender, insurance coverage, and the size of their providers' practices (Kiviniemi et al., 2018; Manteuffel et al., 2014). Data on the patient experience are abundant and available through performance reporting, from sources like the Centers for Medicare and Medicaid Services (CMS, n.d.), and patient perspectives toward patient engagement are well documented in the literature (Rowland et al., 2017). However, provider success and strategies to engage community members attributed to their APMs has not been comprehensively explored (Andrealli et al., 2018; Bekmuratova et al., 2019; Berenson et al., 2016; Chen et al., 2016). Thus, there is an inability to replicate best practices for population engagement, which could improve health outcomes, participant experiences, lower costs, and improve job satisfaction.

Contribution to Social Change

Partnerships between community-based organizations, health care delivery, and public health organizations improve public health outcomes (Cunningham et al., 2020). My study addressed the gap in research by focusing on providers' abilities to influence APM participant behavior. The results may contribute to positive social change by providing meaningful data to public health partnerships that impact community health

outcomes. Thus, my study could improve the ability to influence the behaviors and health outcomes of the community members they serve.

Background

ACOs are one of the APMs designed to alter the reimbursement of healthcare services from a traditional fee-for-service structure to a value-based care model. The initial performance under the Medicare ACO model reduced healthcare expenditures within the attributed population base when compared to traditional Medicare fee-for-service beneficiaries (Nywelde et al., 2015). CMS measures ACO providers across four domains: care coordination, patient safety, patient experience, and preventative health (Mod et al., 2018). Providers are rewarded for the decreased cost of patient care and achievement of various quality metrics outlined in their ACO contracts. Studies have shown that many healthcare providers including those in underserved areas saw ACOs as a means to achieve greater quality while improving population health (Bekmuratova et al., 2019; Berenson et al., 2016). Furthermore, some organizations believed that improving health outcomes outweighed financial incentives (Phipps-Taylor & Shortell, 2016). Conversely, some providers avoided ACO membership because they did not have the infrastructures or collaborative relationships in place to succeed (Bekmuratova et al., 2019), though there has been growing emphasis on preventative care and more collaboration between healthcare providers and traditional public health organizations (Ingram et al., 2015). This is particularly true for cancer prevention initiatives (Basch et al., 2016).

CRC is a leading cause of death in the United States and can be reduced with early detection (Lloyd, 2016). However, almost 25% of adults between 76 and 84 did not meet the U.S. Preventative Services Task Force recommendations for CRC screening before the advent of Medicare ACOs. Furthermore, the early rates of provider recommendations for appropriate CRC screening were very low (Klabunde et al., 2015).

Patient behavior may be the primary driver of improving screening rates, as there has been association between patient behavior, the patient–provider relationship, and adherence to suggested clinical guidelines (Gudzune et al., 2014; Manteuffel et al., 2014). Several studies offered anecdotal patient interventions that increased patient success (Nathan et al., 2016; Singal et al., 2017; Slyne et al., 2017). Moreover, culturally competent approaches are important (Alsayid et al., 2019; Brittain & Murphy, 2015; Chen et al., 2016). Studies also documented perceived barriers as articulated by the provider and provider characteristics that influenced their decision making and ability to succeed (Mastrokostas et al., 2018; Wang et al., 2018). This included the ability to verify the patient's CRC status or availability of specialists (Mastrokostas et al., 2018). For example, a provider recommendation is a primary influence on whether patients participate in CRC screenings (Bian et al., 2016; Bromley et al., 2015), which has been recommended more with health information technology to help alert a patient's CRC risk (Kim et al., 2017; Mankaney et al., 2019). Additionally, it is important to implement systems that support patient engagement activities that influence behavior like motivational interviewing, goal setting, and shared decision making (Mishra et al., 2018). However, some providers have lacked the depth of understanding and practice to

implement these concepts in a meaningful way, and some provider experiences with difficult patients have led to feeling anxious, frustrated, and uncertain with little preparation for how to handle difficult patients (Shapiro et all, 2018).

Ineffective communication and perceived provider uncertainty may also influence patient decision-making process (Beverly et al., 2016). Patients' expectations of providers based on provider characteristics like age, race, and gender also influence their decisions (Alspach, 2018; Mast & Kadji, 2018). For example, uncertainty among female providers was seen as a form of truthfulness, whereas the trait generated mistrust for male providers (Mast & Kadji, 2018). Trust has also been demonstrated to be a contributing factor behind non-compliance of CRC screening for Hispanic patients (Hong et al., 2018).

Fear is another influencer of compliance for all patients, especially for African American patients (Basch et al., 2016; Bromley et al., 2015; Hall et al., 2016; Kiviniemi, Klasko-Foster et al., 2018; Mastrokostas et al., 2018). Fear presents in the form of fear of the findings from the procedure as well as fear of the procedure itself (Bromley et al., 2015). Colonoscopy is the most popular form of CRC screening, which includes multiple steps like scheduling, bowel preparation, sedation and the procedure itself; some of which contain multiple levels of compliance (Powers & Keohane, 2018). Strategies such as enhanced written education, media campaigns, and videos improve compliance with bowel preparations (Andrealli et al., 2018; Cole et al., 2019; Essink-Bot et al., 2016). However, they have been less effective to improve patient health literacy and compliance for completing a colonoscopy (Clark et al., 2017; Enard et al., 2015; Mishra et al., 2018).

Further, studies suggest CRC compliance varies with the type of test offered, which could impact how providers achieve patient compliance with their recommendations (Alsayid et al., 2019; Basch et al., 2016; Bian et al., 2016; Brenner & Chen, 2017; Bromley et al., 2015; Chambers et al., 2016). Medicare recognizes four methods of CRC screening to achieve compliance with the ACO #19 measure: colonoscopy, DNA, stool testing, and fecal occult blood test (Prince et al., 2017).

Key Variables and Alignment

I explored the preventative quality performance measure (ACO #19) for CRC screening under MSSP ACO guidelines as the dependent variable across all three manuscripts. I explored how the independent variables of patient demographic characteristics race, age, gender, and insurance coverage predict performance. I also examined the relationship between practice size (i.e., size of attribution and number of primary care providers) and ACO #19. Manuscript 1 quantified overall performance of ACO #19 based on practice size followed by the influence of patient characteristics in Manuscript 2 and insurance coverage in Manuscript 3.

Provider performance continues to be assessed by CMS (Preston et al., 2018). Most high performing ACOs have had positive collaboration with a hospital, established physicians focused on performance improvement, sophisticated information technology infrastructure, care coordinators, physician feedback, and an effective physician practice before joining the ACO (D'aunno et al., 2018). However, providers who had low quality metric measures before starting their ACO agreement had more room to improve and thus more to gain from their agreements (Green et al., 2015). Moreover, this range for

improvement narrowed in subsequent years once the provider's performance level reached that of their peers. Assessments on the performance of the first ACOs also showed an increase in CRC screening for patients 65 years or older when compared to non-ACO patients or the start of the ACO model (Preston et al., 2018). Studies have also indicated that strategies to improve CRC screening rates include patient reminder programs (Gauci et al., 2018; Grimes et al., 2019), patient outreach programs (Singal et al., 2017), patient financial incentives (Mehta et al., 2019), embedded care coordinators and various patient decision aids (Reuland et al., 2017).

Despite these strategies to increase engagement, significant disparities for screening rates have been found between White and non-White ACO members (Bromley et al., 2015). Additionally, the trend to improve quality measures has not been the case for ACOs in underserved communities or those with a higher number of minority patients (Bromley et al., 2015; Lewis et al., 2017). Yet provider payments continue to be the direct result of their ability to meet established benchmarks, including those for CRC screenings, which are ultimately based on patient behavior.

Additionally, communication is a strategy often cited for improved patient outcomes (Ahmed & Bates, 2016; Alsayid et al., 2019; Beverly et al., 2016; Bientzle et al., 2015), but there are racial disparities in patient–physician communication (Foo et al., 2017). Physician's race has predicted the amount of time the physician spent talking with patients and the level of empathy they displayed. Research has also reported racial, socioeconomic, and gender bias among healthcare providers when making medical decisions (Williams, 2015), though some studies have found no relation to these

characteristics and provider decisions (Haider et al., 2015). Regardless, tailored communication based on patient characteristics can improve communication and patient engagement (Hagiwara et al., 2018), and the disconnect for cancer screening between the patient and provider has been compounded by the lack of provider continuity for minority patients (Arnold et al., 2017).

Socioeconomic status is also a patient characteristic and determinant of CRC screening completion (Farrukh & Mayberry, 2019). Some ACO populations include underserved and vulnerable patients who are covered by Medicaid in addition to their Medicare coverage (Powers & Keohane, 2018). But studies have suggested that lower socioeconomic patients and Medicaid patients experienced bias when they pursued CRC screening (Davis et al., 2017). For example, Nymo et al. (2018) reported that patients with lower income experienced longer wait times when they scheduled CRC screening procedures, whereas patients with higher income were prioritized to enhance their patient experience and satisfaction. Though other studies have suggested Medicaid patients received more opportunities for CRC screening as care coordination improved for dual eligible patients (Craver et al., 2018), providers must be aware of both intentional and unintended bias when working with patients from different cultures and socioeconomic groups (Alspach, 2018).

Conceptual Framework

The socioecological model (SEM) guided my cross-sectional quantitative study in assessing data from the MSSP 2018 public use file (PUF). Under the SEM, provider performance is affected by factors that influence both their decision making and their

effectiveness to influence patient behavior (Rabarison et al., 2013). SEM posits five categorical levels that affect behavior change: the individual, interpersonal, organizational, community/environment, and society/policy levels (Lampard et al., 2013). Though the factors of the SEM are hierarchical, they are also integrated, and a change in one area could impact others (Coreil, 2009).

The positivist ontology also guided my study. Positivism implies that there is a single truth (Burkholder et al., 2016). Medicare reports ACO #19 measure attainment through a PUF; thus, these results reflect a single truth of their performance. In Manuscript 1 I determined how provider size correlates to ACO #19 measure attainment. In Manuscript 2 I determined how patients' race, age, and gender predicted providers' ACO #19 measure attainment. In Manuscript 3 I determined how insurance coverage predicted how effective providers were at achieving ACO #19 measure attainment. The findings for each manuscript were the source of truth under the positivist ontology for my study.

Overview of the Manuscripts

My study provides a more comprehensive assessment of the physicians' ability to influence patient behavior than quantitative data like those from CMS. The U.S. health care system is unsustainable with many health disparities across the population (Foo et al., 2017; Shrank et al., 2019). Thus, there is need to lower health care costs by influencing patient behavior protects vulnerable U.S. citizens at risk if the U.S. healthcare system collapses. A social justice perspective also applies to my study if findings can supplement previous research that shows differences in provider performance or

experiences correlating to race, gender, or socioeconomic status of their patients (Foo et al., 2017). The manuscripts were tied by the overarching theme of physicians' influence on patient behavior. The manuscripts were framed as parallel projects where data collection was captured at the same time, then reported based on the research goals of each manuscript.

Manuscript 1

Problem

Health care delivery and public health professionals form partnerships to reduce the burden of disease and are influenced by policies, healthcare costs, funding sources, and external demand (Cunningham et al., 2020). The MSSP ACO is an APM designed to curb cost and improve patient outcomes for colon cancer among other disease measures. Since CRC is a leading cause of death in the United States (Loyd, 2016), more research is needed to determine the impact of MSSP ACO providers on CRC screening**.**

Research Question

Based on the performance measures of the MSSP, what is the relationship between practice size and compliance with MSSP performance measure ACO #19?

H_0*:* There are no statistically significant differences in the compliance of MSSP performance measure ACO #19 based on practice size.

H_a: There are statistically significant differences in the compliance of MSSP performance measure ACO #19 based on practice size.

Nature of the Study

My cross-sectional quantitative study employed the MSSP PUF for secondary data analysis to examine the association between the independent variable practice size and the dependent variable of compliance with MSSP performance measure ACO #19. The 2019 MSSP PUF was used as a data source.

Limitations, Challenges, and/or Barriers

The MSSP PUF is a secondary data set and has a 1-year delay in reporting. A limitation to using the MSSP PUF file is that all quantitative data are restricted to the variables within the data set. For example, the Preventative Health Domain represents provider influence on patient behavior. These include public health initiatives presented by Healthy People 2020 like getting a flu shot during flu season, a plan to reduce unhealthy body weight, receiving help/information for tobacco use, getting a pneumonia vaccine, and screening for CRC (CMS, n.d.). My study examined ACO #19 or colon cancer screening, which is the most complex measure of behavior change captured by MSSP reporting (CMS, 2017). However, the MSSP PUF database provided an adequate sample size for successful compliance with ACO #19 to meet the statistical requirements of my study.

Other Information

My study assessed health professional's influence on complex patient behavior. The MSSP ACO PUF contains physician performance against 32 measures across four domains (CMS, n.d.). The results were the official CMS findings and used to pay

provider incentives (Noble et al., 2014). Therefore, these measures were valid representations of physician performance.

Manuscript 2

Problem

CRC is a leading cause of death in the United States, with significant disparities between population groups (Loyd, 2016). The MSSP ACO is an APM designed to curb cost, improve patient outcomes for colon cancer and other disease measures. But more research is needed to determine the impact of MSSP ACOs on CRC screening for different types of patients.

Research Question

Based on the performance measures of the MSSP, what is the relationship between the ACO population's demographics race, age, and gender and compliance with MSSP performance measure ACO #19?

H_0: There are no statistically significant differences in compliance with MSSP performance measure ACO #19 based on the ACO population's demographics, race, age, and gender.

H_a: There are statistically significant differences in compliance with MSSP performance measure ACO #19 based on the ACO population's demographics, race, age, and gender.

Nature of the Study

The nature of Manuscript 2 was a cross-sectional quantitative study and employed the MSSP PUF for secondary data analysis to examine the association between the

independent variables race, age, and gender and the dependent variable of compliance with MSSP performance measure ACO #19. Again, the 2019 MSSP PUF was the primary data source.

Limitations, Challenges, and/or Barriers

The MSSP PUF is a secondary data set and has a 1-year delay in reporting. A limitation to using the MSSP PUF file is that all quantitative data are restricted to the variables within the data set. For example, the Preventative Health Domain represents provider influence on patient behavior. These include public health initiatives presented by Healthy People 2020 like getting a flu shot during flu season, a plan to reduce unhealthy body weight, receiving help/information for tobacco use, getting a pneumonia vaccine, and screening for CRC (CMS, n.d.). My study examined ACO #19 or colon cancer screening, which is the most complex measure of behavior change captured by MSSP reporting (CMS, 2017). However, the MSSP PUF database provided an adequate sample size for successful compliance with ACO #19 to meet the statistical requirements of my study.

Manuscript 3

Problem

CRC is a leading cause of death in the United States, with significant disparities between population groups (Loyd, 2016). The MSSP ACO is an APM designed to curb cost, improve patient outcomes for colon cancer and other quality measures. Studies suggest bias and disparities for patients based on sociodemographic status (Foo et al., 2017). Furthermore, research has demonstrated disparities in CRC screening based on

insurance type (Kiviniemi et al., 2018). Thus, ore research is needed to determine the impact of MSSP ACO on CRC screening for patients with different types of insurance.

Research Question

Based on the performance measures of the MSSP, what is the relationship between insurance coverage and compliance with MSSP performance measure ACO #19?

H_0*:* There are no statistically significant differences in compliance with MSSP performance measure ACO #19 based on insurance coverage.

H_a*:* There are statistically significant differences in compliance with MSSP performance measure ACO #19 based on insurance coverage.

Nature of the Study

The nature of Manuscript 3 was a cross-sectional quantitative study and employed the MSSP PUF for secondary data analysis to examine the association between the independent variable insurance coverage and the dependent variable of compliance with MSSP performance measure ACO #19. Again, the primary source of data was the 2019 MSSP PUF.

Limitations, Challenges, and/or Barriers

The MSSP PUF is a secondary data set and has a 1-year delay in reporting. A limitation to using the MSSP PUF file is that all quantitative data are restricted to the variables within the data set. For example, the Preventative Health Domain represents provider influence on patient behavior. These include public health initiatives presented by Healthy People 2020 like getting a flu shot during flu season, a plan to reduce

unhealthy body weight, receiving help/information for tobacco use, getting a pneumonia vaccine, and screening for CRC (CMS, n.d.). My study examined ACO #19 or colon cancer screening, which is the most complex measure of behavior change captured by MSSP reporting (CMS, 2017). However, the MSSP PUF database provided an adequate sample size for successful compliance with ACO #19 to meet the statistical requirements of my study.

Significance

Each manuscript provided data that may improve the strategies public health and health care delivery professionals use to reduce the burden of CRC. I addressed a gap in research in Manuscript 1 to show how ACOs with more patients were more compliant with CRC screening recommendations, though results indicated that more non-White patients were less compliant with screenings and the number of providers in an ACO did not influence compliance with the measure. In Manuscript 2, I expanded on current literature on disparities in CRC screening based on race, age, and gender. I found that ACOs with more Black patients were less compliant with ACO #19. I also demonstrated that ACOs with patients between the age of 65–85 more likely meet CRC recommendations. Lastly, I addressed a gap in research in manuscript 3 to show ACO #19 performance decreases as the number of Medicaid patients in the population increases.

My research can help decrease disparities for CRC screening and incidence of CRC among vulnerable populations. Furthermore, the data may help public health professionals, community advocates, and healthcare providers drive behavior adoption

for their community members. Lastly, my study provides a foundation for population health initiatives beyond CRC related illness.

Policy

Alternative practice models incorporate value-based care methodologies that move health care away from a costly volume-driven fee-for-service structure toward quality incentivized population health management frameworks, many of which hinge on partnerships between primary care physicians and public health organizations (Nywelde et al., 2015). Manuscript 1 applies to policies that govern the minimum number of patients in ACOs that might influence CRC screening rates for elderly patients. Furthermore, the results can influence policy related to provider patient ratios. Manuscript 2 applies to policies that support health and wellness initiatives in communities of color and patients aged 65 year and older. Manuscript 3 can influence policy related to insurance coverage particularly for Medicaid and Medicare patients, applying toward additional policies for lower socioeconomic populations as to the eligibility for these services and the scope of benefits they receive.

Overall, my study will influence policy by outlining the success, shortcomings, and possible rationale for health outcomes. This could provide policymakers a unique perspective to maintain or improve the MSSP ACO program or other partnership approach programs between community organizations, healthcare delivery, and public health organizations.

Social Change

Each manuscript promotes positive social change by providing meaningful data to the public health organization and health care provider partnerships engaged in transforming healthcare from a transactional delivery system to an evidence-based system of value (Berenson et al., 2016). Manuscript 1 may improve public health and healthcare professionals' ability to influence the behaviors and health outcomes of the community members they serve and provide an evidence-based approach to determining the structure or model for programs designed to improve health outcomes. Manuscript 2 can help decrease the prevalence and disparities of CRC and by doing so reduce the economic and quality of life burden for individuals and communities suffering from the disease. Moreover, Manuscripts 2 and 3 may help to reduce disparities for CRC screening and incidence of CRC among vulnerable populations.

Overall, my study provides a foundation for population health initiatives beyond CRC related illness, thus improving the well-being of communities and increase public health emergency preparedness. Therefore, my study can improve public health and healthcare professionals' ability to influence the behaviors and health outcomes of the community members they serve. My findings can guide both public health and healthcare provider leaders on ways to train professionals better, reduce frustration, improve success, and achieve higher levels of satisfaction in their work both in routine interventions and public health emergencies.

Summary

Each manuscript explores Medicare's MSSP ACOs as one of the interventions initiated by CMS to promote collaboration, better health outcomes, and lower costs of care for patients 65 years or older (Noble et al., 2014). One component of ACOs includes preventative care (Noble et al., 2014). Public health professional and healthcare providers have mutual interest to increase appropriate CRC screening rates to reduce the incidence, economic burden, and mortality from CRC (Bachman et al., 2018; Bachrach et al., 2016). But studies suggest disparities among the population for age, sex, and ethnicity (Bachman et al., 2018). Studies also show an ongoing variance of care delivered to people with different levels and type of insurance coverage (Kiviniemi et al., 2018; Manteuffel et al., 2014). Thus, I assessed the effectiveness of meeting CRC screening guidelines based on provider size, patient characteristics variables and patient insurance type for ACO #19 measures for CRC screening.

Part 2: Manuscripts

The Relationship Between Advanced Payment Model Providers and Patient Behavior: Practice Size and Provider Influence on Patient Behavior

Harry Petaway, MPA

Walden University

Objective: This study assesses the preventative quality performance measure (ACO #19) for colon cancer screening under Medicare Shared Savings Plan ACO guidelines. I quantified the overall performance of ACO #19 based on provider practice size.

Methods: A cross-sectional quantitative study was conducted for organizations who participate as a Medicare Shared Savings Plan Accountable Care Organization. The research included secondary data analysis of the 2019 Medicare Shared Savings Plan PUF on quality performance.

Outlet for Manuscript

The *American Journal of Public Health* (AJPH) is the intended journal for this manuscript (https://ajph.aphapublications.org/). The initial submission requires a title page with the manuscript title, author name and affiliations, and full abstract and the manuscript with author and university information removed. In addition, the manuscript should contain the following elements:

a. Title and abstract
b. page numbers
c. numbered lines (in Word, > Page Setup > Line Numbers > Continuous) throughout the text of the manuscript;
d. 1.5 or double spacing with a font size of 12
e. tables and figures embedded at the end of the manuscript, OR uploaded as separate files

Submission also requires a cover letter with concise text (maximum 150 words) that provides a description of what the paper adds to the knowledge on the topic, especially in respect to material previously published in the journal and elsewhere; includes the public health importance of the paper; and highlights the main message of the paper in one sentence. With the exception of history essays, all AJPH articles follow the AMA Manual of Style, 10th Edition. Substantive notes and footnotes are not permitted.

Abstract

Public health efforts include vaccination and screening initiatives to reduce the burden of disease. This study focused on colorectal cancer (CRC) screening behaviors of accountable care organization (ACO) patients of different population sizes. It addressed performance among organizations based on the number of primary care providers in the ACO. This study used the socioecological model and a cross-sectional quantitative design to assess data from the Medicare Shared Savings Plan public use file 2019 to expand on current literature that determined patient behavior was the primary driver to improve healthcare quality and reduce costs. ACOs with more patients generally had better CRC screening compliance. However, the results showed that ACOs with more non-White patients were less successful. Results also indicated that participating in an ACO may mediate the constraints of smaller provider practices to improve patient care, though the results found that lesser numbers of primary care providers in an ACO did not negatively influence performance. The implications for positive social change include data to reduce disparities for CRC screening and incidence of CRC among vulnerable populations and provide a foundation for population health initiatives and policies beyond CRC related illness, which can improve the well-being of communities and increase public health emergency preparedness.

Introduction

Healthcare costs in the United States are rising at an unsustainable rate and include significant disparities in health outcomes that have been attributed to social determinants of health (Foo et al., 2017; Noble et al., 2014). Physicians and public health professionals lead much of the effort to manage this public health crisis (Ingram et al., 2015). As a result, public health agencies and clinical health organizations have formed partnerships in several communities to form new public healthcare delivery models (Noble et al., 2014). These partnerships were designed to improve health by influencing individual behavior and addressing social determinants of health (Bachrach et al., 2016). For example, the Institute of Healthcare Improvement's Quadruple Aim outlined a framework to improve health outcomes, lower healthcare costs, improve patient experience, and improve clinician satisfaction (Wagner et al., 2018). This contributed to the development of experimental alternative payment delivery models (APMs) to achieve components of the Quadruple Aim, but these new designs had varying degrees of success (Noble et al., 2014). Studies have shown that population engagement was essential to guide community members toward behaviors that lead to healthier outcomes, which could reduce the overall cost of care (Grand et al., 2014); however, there was little evidence of which strategies were most successful at influencing the population's behavior.

Problem

Physicians have indicated that patient behavior is the key to improve health quality and outcomes, yet many have found it difficult to influence individual behavior

(Hibbard et al., 2015). Moreover, researchers have found disparities in patient compliance with health behavior recommendations (Kiviniemi et al., 2018; Manteuffel et al., 2014) linked to patient characteristics and provider variables like the size of provider practices (Kiviniemi et al., 2018; Manteuffel et al., 2014). Data on the patient experience are captured through performance reporting by the Centers for Medicare and Medicaid Services (CMS, n.d.), and patient perspectives toward patient engagement have been well documented in the literature (Rowland et al., 2017). However, provider experiences, perceptions, success, and strategies to engage community members attributed to their APMs are not represented in detail in previous research (Andrealli et al., 2018; Bekmuratova et al., 2019; Berenson et al., 2016; Chen et al., 2016). Thus, there is an inability to replicate the best practices for population engagement that improve participant experiences, job satisfaction, health outcomes, and lower costs. I addressed this gap in research by focusing on the relationship of practice size and providers' influence on APM patient behavior. I explored the preventative quality performance measure for colon cancer screening ACO #19 for the Medicare Shared Savings Plan (MSSP) accountable care organization (ACO) guidelines.

Significance of the Study

APMs introduced patient engagement initiatives to lower healthcare costs in the United States with different levels of success (Noble et al., 2014). Extensive quantitative data on APM quality are captured by CMS performance reports (CMS, n.d.). The literature, however, has not shown evidence on why physicians were successful at influencing patient behavior. For example, Smiddy et al. (2015) showed that financial

incentives increased the number of focus groups in the United Kingdom but found little impact on the quality of care delivered. In the current study, I explored provider experiences with managing patient populations of different sizes and ethnicities to explain to what degree they affect patient behavior compared to the measures that determine their payments and further explain the impact of provider collaboration within advanced payment models on their outcomes. My study showed that ACOs with larger patient populations were more compliant with CRC screening recommendations, and ACOs with more non-White patients were less compliant with screenings. Further, the number of providers in an ACO did not influence compliance with the measure.

Relevant Contribution to the Body of Knowledge

This manuscript is the first of three manuscripts to a cross-sectional quantitative study to explore the preventative quality performance for colon cancer screening under MSSP ACO guidelines. My broader study explores how patient demographic characteristics race, age, gender, and insurance coverage predict performance. The purpose of my study was to assess the relationship between practice size and provider effectiveness at influencing patient behavior as measured by the compliance of MSSP performance measure ACO #19. This manuscript fills a gap in research by focusing on provider practice characteristics. My cross-sectional study provides a more comprehensive assessment of physician influence on patient behavior than studies like those from CMS.

Framework

The socioecological model (SEM) guided my cross-sectional quantitative study in assessing data from the MSSP public use file (PUF). Under the SEM, provider performance is affected by factors that influence both their decision making and their effectiveness to change patient behavior (Rabarison et al., 2013). SEM posits five categorical levels which affect behavior change: the individual, interpersonal, organizational, community/environment, and society/policy levels (Lampard et al., 2013). Though the factors of the SEM are hierarchical, they are also integrated, and a change in one area could impact others (Coreil, 2009).

The positivist ontology also guided my study. Positivism implies that there is a single truth (Burkholder et al., 2016). Medicare reports ACO #19 measure attainment through a PUF; thus, these results reflect a single truth of their performance. I showed how the number of providers in an ACO and the size of the patient population correlate to their ACO #19 measure attainment. These findings are the source of truth under the positivist ontology for my study. Additionally, the definition of "provider success" is precise and supports a quantitative ontology of positivism where there is one true reality (Burkholder et al., 2016). Positivism guided my cross-sectional quantitative study to answer the question "How effective were providers at influencing patient behavior based on the performance measure ACO #19 of the Medicaid Shared Savings Plan?" I analyzed archival data from the CMS to support the positivist approach to my research question (Burkholder et al., 2016).

My study is influenced by multiple contexts. The personal contexts for my study include my knowledge and experience with advance payment models and patient engagement. The social contexts include CMS guidelines, the fluidity of US healthcare policy, political climate, geographic locations, and local healthcare delivery priorities. Lastly, interpersonal contexts include Walden University dissertation committee representatives.

Background

The first ACOs were created to reduce preventable health problems amid cost constraints have varied in United States (Noble et al., 2014). Hibbard et al. (2015) documented that compensation from similar models used in other countries influenced physician opinions on the importance of patient behavior. They further provided evidence that patient behavior was the primary driver of improving quality (Hibbard et al., 2015). Other studies showed that improvements in patient engagement lead to better health outcomes (Simmons et al., 2014; Grand et al., 2014)), and that both independent healthcare professionals and healthcare organizations committed significant investments to improve outcomes, lower costs and improve patient experiences (Nwelde et al., 2015).

Physicians in the United States agreed that patient behavior was the key determinant to improve quality and outcomes, yet, many found frustration when trying to influence individual behavior (Hibbard et al., 2015). While many providers perceived their role in the community and within population health as “medicine-based”; a growing emphasis on preventative care and the diverse characteristics of their patient attribution fostered better collaboration between healthcare providers and traditional public health

organizations (Ingram et al., 2015). This was particularly true for mutual objectives such as cancer prevention (Basch et al., 2016).

Research showed that differences in the structures of provider practices influenced their capacities to provide care and influence patient behavior (Casalino & Chenven, 2017; Casalino et al., 2013; Kim et al., 2017; Pineault et al., 2016). These included financial stability, training, staff, and other key resources like health information technology (Casalino & Chenven, 2017; Casalino et al., 2013; Kim et al., 2017). However, researchers have suggested that some providers believed collaborative partnerships might mediate resource constraints tied to their practice size and geographic designation (Kim et al., 2017). Other evidence showed that the collective patient population was based partly on their practice size and was a key determinant of their success with CMS quality measurements (Greene et al., 2015).

ACOs were designed to shift the focus of healthcare services from a traditional fee for service structure to a value-based care model tied to better health outcomes (Noble et al., 2014). Nyweide et al. (2015) proved the initial performance under the Medicare ACO model lowered costs when compared to traditional Medicare fee-for-service beneficiaries. The CMS measures ACO providers across four domains, which include care coordination, patient safety, patient experience, and preventative health (Mod et al., 2018). Providers are paid more for achieving multiple quality metrics outlined in their ACO contracts and for the providing care at a lower cost. as well as (Noble et al., 2014). Studies showed that many healthcare providers including those in underserved areas saw ACOs as a means to provide greater quality while improving population health

(Bekmuratova et al., 2019; Berenson et al., 2016). Furthermore, some organizations perceived the goal to improve patient care, simply outweighed any financial rewards they may receive (Phipps-Taylor & Shortell, 2016). Conversely, other evidence showed that providers avoided ACO membership as they did not have the infrastructures or collaborative relationships in place to succeed (Bekmuratova et al.).

Colorectal cancer (CRC) is a leading cause of death in the United States (Lloyd, 2016). The Centers for Disease Control and Prevention estimated over 40,000 deaths attributed to colon cancer in 2016 (Bachman et al., 2018). CRC screening is a key public health focus and measurement of ACOs. The risk of CRC mortality can be reduced with early detection (Lloyd, 2016). Focused efforts to increase CRC screening led to an overall reduction of CRC related deaths in the last decade; yet, several disparities continue to exist across, socioeconomic and racial/ethnic boundaries (Bromley, May, Federer, Spiegel, & Van Oijen, 2015). Klabunde et al. (2015) reported that almost 25% of adults between 76 and 84 did not meet the U.S. Preventative Services Task Force recommendations for CRC screening before the advent of Medicare ACOs. Furthermore, the incidence of provider recommendations for appropriate CRC screening was very low (Klabunde et al., 2015). This problem was further compounded with racial disparities for non-White patients who were less likely to complete screening and had an increased prevalence of adverse health outcomes as a result (Klabunde et al.).

A growing body of evidence also documented disproportionate racial and socioeconomic disparities and highlighted the diverse needs to motivate patients toward compliance (Ashktorab et al., 2017; Bromley et al., 2015; Burnett-Hartman et al., 2016;

Chablani et al., 2017). Several studies offered anecdotal patient interventions which increased patient success (Nathan et al., 2016; Singal et al., 2017; Slyne et al., 2017). Studies which focused on patient experience suggested culturally competent approaches based on different patient characteristics (Alsayid et al., 2019; Brittain & Murphy, 2015; Chen et al., 2016). Research also documented provider perceptions of barriers and provider characteristics that influenced their decision making and success (Mastrokostas et al., 2018; Wang et al., 2018). These included the basic ability to verify their patients' correct CRC status and the clinician's ability to confer with specialists (Mastrokostas et al., 2018).

For example, a provider recommendation was a primary influence on whether patients of all demographic groups participated in CRC screenings (Bian et al., 2016; Bromley et al., 2015). Some studies showed that health information technologies that shared patient information, alerted providers to the patient's CRC risk and screening status nudged providers to provide CRC screening recommendations (Kim et al., 2017b; Mankaney et al., 2019). Additionally, other studies reiterated the importance of Patient Behavior on quality performance and the need to implement systems to support patient engagement activities that influence behavior (Mishra et al., 2018). These included the concepts of, motivational interviewing, goal setting, and shared decision making (Mishra et al., 2018). However, a study conducted by Mishra and colleagues (2018) showed that while providers were aware of these concepts, they lacked the depth of understanding and practice to implement them in a meaningful way. Shapiro et al. (2018) further described provider experiences with tough to manage patients in which providers described

themselves as anxious, frustrated, and uncertain with little preparation for how to handle difficult patients.

Ineffective communication and perceived provider uncertainty may influence patient decision-making process (Beverly et al., 2016). This can also be confounded by patients' expectations based on the provider's characteristics such as age, race, gender and experience (Alspach, 2018; Mast & Kadji, 2018).Fear was another influencer of compliance for all patients, but particularly among non-White patients (Basch et al., 2016; Bromley et al., 2015; Hall et al., 2016; Kiviniemi, Klasko-Foster et al., 2018; Mastrokostas et al., 2018). Fear presented in the form of fear of the findings from the procedure as well as fear of the procedure itself (Bromley et al., 2015).

Colonoscopy is the most popular form of CRC screening, and includes multiple steps like scheduling, bowel preparation, sedation, and the procedure itself; some of which contain multiple levels of compliance (Powers et al., 2018). For example, strategies such as enhanced written education, media campaigns, and videos improve compliance the bowel preparation step of colonoscopies (Andrealli et al., 2018; Cole et al., 2019; Essink-Bot et al., 2016). However, they were demonstrated as less effective to improve patient health literacy and compliance for completing the colonoscopy procedure (Clark et al., 2017; Enard et al., 2015; Mishra et al., 2018).

Medicare recognizes four methods of colonoscopy screening to demonstrate compliance with the ACO #19 measure (Prince et al., 2017). These include colonoscopy, DNA, stool testing, and fecal occult blood test. Studies suggest CRC compliance varies with the type of test offered, Thus, could impact the CRC screening recommendations

that providers make to their patients (Alsayid et al., 2019; Basch et al., 2016; Bian et al., 2016; Brenner & Chen, 2017; Bromley et al., 2015; Chambers et al., 2016).

My study fills a gap in research by focusing on provider practice characteristics and the abilities of providers to influence the behavior of ACO patients to achieve compliance with CRC screening recommendations.

Research Questions and Design

The nature of the manuscript is a cross-sectional quantitative study for the following research question:

Based on the performance measures of the MSSP, what is the relationship between practice size and compliance with MSSP performance measure ACO #19?

H_0: There are no statistically significant differences in compliance with MSSP performance measure ACO #19 based on practice size.

H_a: There are statistically significant differences in compliance with MSSP performance measure ACO #19 based on practice size.

Cross-sectional quantitative studies are descriptive research to describe community characteristics at a single point in time. I analyzed data from the MSSP PUF from 2019. I assessed the relationship of dependent variable ACO performance for measure ACO #19 and the independent variable practice size. My research design required a way of to measure patient behavior. CMS ACO #19 is a cumulative measure based on the number of people that participated in CRC screening. Therefore, I assumed that CMS data are a valid measure of patient behavior.

Methods

Operational Definitions

ACO #19: Percentage of adults between 50–75 years of age who had appropriate screening for CRC for ACO quality reporting (CMS, 2017).

Alternative payment delivery models (APMs): Several experimental advance/APMs have been created with varying success to introduce new patient engagement initiatives to combat the United States skyrocketing healthcare costs (Noble et al., 2014).

Attribution: The patients assigned to the health care provider for which they are being measured (Noble et al., 2014).

Patient engagement: Studies show that improvements in patient engagement lead to better health outcomes (Simmons et al., 2014).

Practice size: The number of patients and the number of primary care physicians in an ACO.

Bias and Limitations

I analyzed archived data from the CMS. Therefore, the quality of this quantitative data source was beyond my control as the researcher and contingent on the data collection process for MSSP reporting (Burkholder et al., 2016). CMS (2017) allows providers to review and dispute published performance data, followed by a final CMS ruling. I used the final report issued by CMS, which included corrections to improve data quality. I could not control confounding variables that may influence provider–patient

attribution (Noble et al., 2014). These included patient comorbidities that can affect patients abilities to comply with healthcare treatment plans (DeJean et al., 2013).

Scope and Delimitations

The MSSP ACO PUF details physician performance against 32 measures across four domains (CMS, n.d.). The results are the official CMS findings and used to pay provider incentives (Noble et al., 2014). Therefore, these measures are valid representations of physician performance. The scope of my study was to evaluate physicians' performance against the CMS measurement for colon cancer screening ACO #19.

I limited my target population to the subset of organizations that had previous experience with MSSP ACOs and those who reported data for the 2019 MSSP reporting year. Excluding first-year MSSP participants improved credibility by ensuring that providers in the sample had a baseline measurement that reflected their performance better (Noble et al., 2016). Disparities in provider–patient interactions may be influenced by the factors race and patient insurance coverage (Foo et al., 2017). Therefore, a third delimitation limited the participant sample to those with a patient base with at least 10% non-White and accept both Medicaid and Medicare patients (CMS, 2017). Succesful attainment of ACO #19 was determined by a score of at least 30% (CMS, 2017). I differentiated well-performing providers from poor performing using this recognized benchmark as a fourth delimitation (CMS, 2017).

Design

Positivism guided the cross-sectional quantitative study to answer the question, "How effective are providers at influencing patient behavior based on the performance measure ACO #19 of the Medicaid Shared Savings Plan?" Archival data analysis from the CMS 2019 MSSP PUF supported the positivist approach to my research question. I used the quality performance data for healthcare providers reported in the PUF to determine their effectiveness at influencing patient behavior as it correlated to their practice size.

Instrumentation

Archival data from the MSSP PUF for 2019 was used for the data collection process. The MSSP ACO PUF was derived from a combination of provider claims and survey data. The PUF files are available for performance years 2013-2019. The PUF file included hundreds of variables, descriptions and performance measure outcomes. These included measures for six behavior related preventative measures. Performance measures were captured as a percent of the total population where a higher score means higher performance for that measure.

Provider incentives for MSSP ACOs were based on quantitative analysis of their performance against established benchmarks (Noble et al., 2014). As such the current reporting for the effectiveness of APMs is dichotomous as the providers did or did not meet their measurement objectives (CMS, n.d.). This clear determination of provider success supports a quantitative ontology of positivism in which there is one true reality (Burkholder et al., 2016). Furthermore, quantitative analysis of provider performance

using MSSP public use data is an accepted practice among the healthcare community (Noble et al., 2016).

Participants

I limited the evaluation of provider performance to organizations in the United States who had previous ACO experience prior to 2019 and who reported data for the 2019 MSSP reporting year. Previous studies showed that providers treated patients differently according to sociodemographic characteristics (Foo et al., 2017; Manteuffel et al., 2014). Therefore, I restricted participants to ACOs with a patient base of at least 10% non-White and who accepted both Medicaid and Medicare patients. Furthermore, CMS set a minimum standard of 30% achievement to comply with MSSP guidelines. Therefore, participant selection was based on provider performance compared to the 30% benchmark.

Data Sources

Archival data was reviewed from the MSSP PUF for 2019. I used data for new and returning ACO participants from the 2019 MSSP PUF. I described the extent that ACOs were successful with measure ACO #19. I uploaded the entire MSSP PUF database into SPSS v25 for review, analysis and statistical testing.

Quantitative Collection and Analysis

I assessed how effective ACOs were at changing patient behavior. I described the extent that ACOs were successful at achieving colon cancer screening for measure ACO #19. I uploaded the entire 2019 MSSP PUF database into SPSS v25 for review, analysis and statistical testing. I retained the native MSSP PUF document, which was uploaded

multiple times with all statistical tests replicated to ensure integrity and reliability. I used Pearson Correlation and linear regression to determine if there was a significant relationship between ACO practice size and performance. The level of significance was set to 0.05.

Results

Research question: Based on the performance measures of the MSSP, what is the relationship between practice size and compliance with MSSP performance measure ACO #19?

H_0: There are no statistically significant differences in the compliance of MSSP performance measure ACO #19 based on practice size.

H_a: There are statistically significant differences in the compliance of MSSP performance measure ACO #19 based on practice size.

Execution

I assessed archival data from the MSSP PUF (CMS, n.d.) for 2019 for 470 ACOs. I calculated an additional variable to reflect the percentage of the total population by race, age, gender, and Medicaid status in Microsoft Excel. The modified file was then entered into SPSS version 25 to organize, code, and screen data. Data for ACO #19 score and practice size were recoded to ordinal categorical data. Values were calculated including frequency counts and percentages with SPSS. Descriptive data analysis was performed for frequencies for all ACOs.

The final sample size was narrowed to 140 ACOs based on the inclusion and exclusion criteria for the study. These included previous experience in the MSSP

program and an ACO #19 score of 30 or more, an attribution that was at least 10% non-White. I performed statistical assumption tests for normal distribution, homoscedasticity, and linearity between dependent and independent variables before research question analysis. Table 1 summarizes the dependent, independent variables, and statistical analyses used to evaluate the research question.

Table 1

Variables and Statistical Tests Used to Evaluate Research Questions

Research Question	Dependent Variable	Independent Variable	Analysis
What is the relationship between practice size and compliance with MSSP performance measure ACO #19?	ACO #19 Score	Practice Size-Providers	Pearson Correlation Linear Regression
What is the relationship between practice size and compliance with MSSP performance measure ACO #19?	ACO #19 Score	Practice Size-Attribution	Pearson Correlation Linear Regression

Note. ACO = accountable care organization

Descriptive Statistics for all ACOs

Descriptive analysis for all (n = 470) ACOs and the target sample (n = 140) were conducted for ACO #19 performance. Frequencies were reviewed for practice size and characteristics of ACO attributions for age, race, gender, and insurance. Table 2 shows the ACO #19 performance with most organizations achieving between 50 and 90%. Performance for the target population aligned with the larger base with most organizations (n = 85) achieving between 70–89% followed by those between 50–69% (n = 47).

Table 2

ACO #19 Performance Range and Frequency

	All ACOs		Target ACOs	
ACO #19 Score	Frequency	Percent	Frequency	Percent
0-29	4	0.9		
30-49	13	2.8	4	2.9
50-69	157	33.4	47	33.6
70-89	287	61.1	85	60.7
90 to 100	9	1.9	4	2.9
Total	470	100.0	140	100.0

Note. ACO = accountable care organization

Practice size as measured by primary care physicians ranged from 20 to 2,299. Table 3 shows that most ACOs had less than 200 primary care providers with the majority falling between 50–99 at roughly 22%.

Table 3

Range and Frequency of Primary Care Providers in ACOs

	All ACOs		Target ACOs	
Primary Care Providers	Frequency	Percent	Frequency	Percent
0-49	72	15.3	15	10.7
50-99	101	21.5	32	22.9
100-149	74	15.7	18	12.9
150-199	41	8.7	11	7.9
200-249	30	6.4	9	6.4
250-299	25	5.3	9	6.4
300-349	15	3.2	5	3.6
350-399	16	3.4	6	4.3
400-499	30	6.4	8	5.7
500-599	16	3.4	7	5.0
600 or more	50	10.6	20	14.3
Total	470	100.0	140	100.0

Note. ACO = accountable care organization

Table 4 shows the practice size characteristics based on patient attribution for all ACOs. ACOs that did not report a score for ACO #19 (n = 4) were removed. Of the remaining (n = 466) there was a total of 9,918,470 patients enrolled in the ACOs of which 4,275,182 (43%) were male and 5,643,285 (57%) female. Eighty-six percent of the

population was white and 14% non-White. Ages ranged from 0-64 (14%), 65-74 (46%), 75-84 (28%) and 85 or older (12%). Beneficiaries with Medicaid totaled 606,989. The patient attribution for all ACOs ranged from 2,193 to 239,924 patients.

Table 4

Range and Percentage of Attributions Across All ACOs

	Minimum	Maximum	Sum	Percent
Total Patients	2,193	239,924	9,918,470	
Female	1,240	133,423	5,643,285	57%
Male	953	106,501	4,275,182	43%
Medicaid Patients	67	17,981	606,989	6%
Non-Medicaid Patients	1,346	181,135	7,917,736	80%
Total Age 0_64	262	41,238	1,369,626	14%
Total Age 65_74	817	109,019	4,607,276	46%
Total Age 75_84	619	64,190	2,799,157	28%
Total Age 85Plus	186	25,477	1,142,411	12%
White	479	219,069	8,519,870	86%
Non-White	97	24,215	1,398,600	14%

The attribution of most ACOs in the target population was under 40,000 patients. Table five shows that over half of the ACOs carried an attribution of between 10,000 and 39,999 followed by a range of 2,193 to 9,999 (27%).

Table 5

Range and Percentage of Attribution

Attribution Range	Frequency	Percent
0-9,999	38	27.1
10,000-39,999	77	55.0
40,000-79,999	19	13.6
80,000 or more	6	4.3
Total	140	100.0

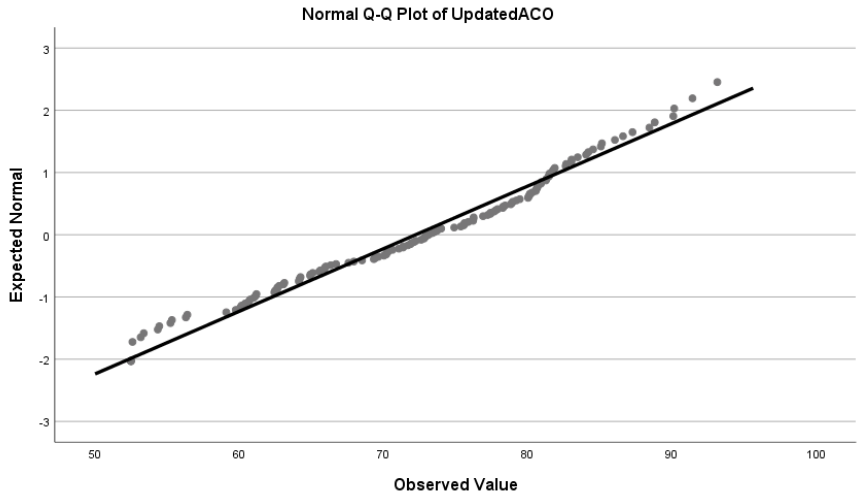
Tests of Assumptions

I conducted assumption tests of the dependent variable ACO #19. The data were normally distributed and follow a normal distribution curve. The skewness and kurtosis tests for normal distribution should fall between the rage of ± 2 and ±7 respectfully. The

ACO #19 score data for skewness was -.287 and kurtosis was -.692. The Kolmogorov-Smirnov test for normality was insignificant at $p>.05$. Figure one shows the normal Q-Q plot of the data.

Figure 1

Normal Q-Q Plot for ACO #19 Performance



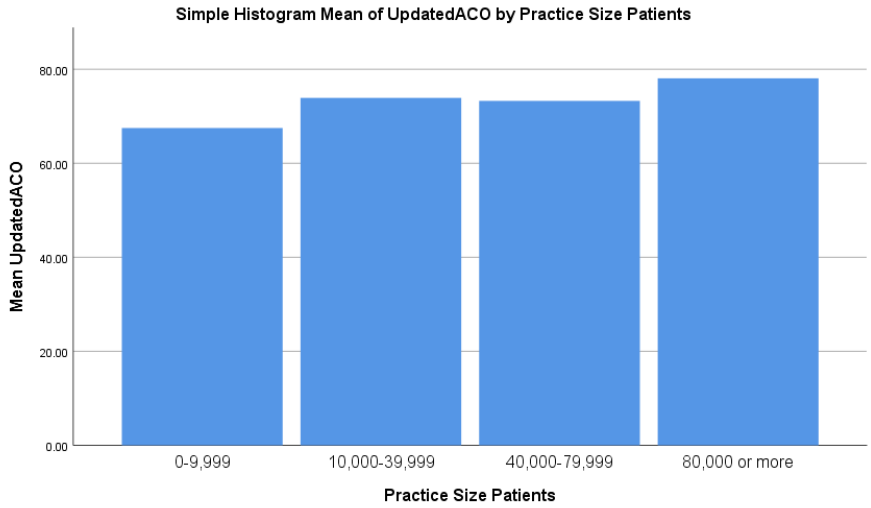
Inferential Statistics Manuscript 1

Previous studies define practice size as the total number of patients or the total number of primary care physicians. I found practice size as defined by the total number of primary care physicians in the ACO did not significantly influence ACO #19 performance. However, the results showed that practice size as defined by the total number of patients had a statistically significant influence on ACO #19 performance. Thus, the null hypothesis that practice size does not have a significant influence on ACO #19 performance was rejected. I used bivariate correlation to determine relationship between the dependent variable ACO #19 Performance and independent variables for practice size. There was not a significant correlation between ACO #19 performance and

the number of primary care providers. However, there was a statistically significant Pearson Correlation of .214 between ACO #19 and the number of patients with $p = .011$. Figure two shows that as ACO #19 performance increases with the total number of patients.

Figure 2

ACO Practice Size Attribution



Note. ACO = accountable care organization

Furthermore, analysis showed the number of non-White patients was not significant but the percentage of the total population size that was non-White had a negative correlation of -.416 and $p<.001$. See Table 6.

Table 6

Correlation Between ACO #19 Performance and Practice Size

		ACO #19 Performance	Total Patients	Primary Care Physicians	Total Non-White	Non-White Percentage
ACO #19 Performance	Pearson Correlation	1	.214*	0.087	0.014	-.416**
	P value		0.011	0.309	0.871	0.000
	N	140	140	140	140	140

Note. ACO = accountable care organization. *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Linear Regression

I used linear regression to further analyze the correlations between ACO #19 Performance and the independent variables of total patients and percent of population that was non-White. The influence of total patients on performance was statistically significant *(*$F(1,138) = 6{,}596$, $p<.05$).The total number of patients attributed to the variance in positive correlation by 4.6% with an R^2 value of .046 and adjusted R^2 of .039. ACO #19 performance increased as population size increased with a coefficient of $B = 8.9$.

The relationship between the percent of non-White patients of the total practice size and ACO #19 performance was statistically significant *(*$F(1,138) = 28.8$, $p<.05$).The percentage of non-White patients of the total population based attributed to the variance in negative correlation by 17.3% with an R^2 of .173 and an adjusted R^2 of .167. ACO #19 performance decreased as the Non-White population increased with a coefficient of $B = -.298$.

Discussion

Interpretation

My research correlates with previous research around physician influence on paitent behavior and patient compliance with physicina recommendations. For example, Klabunde et al. (2015) reported that almost 25% of adults between 76 and 84 did not meet the U.S. Preventative Services Task Force recommendations for CRC screening before the advent of Medicare ACOs. My findings showed that only four out of 470 ACOs did not meet the minimum performance score of 30 for ACO #19; however, 36% of the 140 target ACOs scored under 70%.

Other studies showed that differences in the structures of provider practices influenced their capacities to influence patient behavior (Casalino & Chenven, 2017; Casalino et al., 2013; Kim et al., 2017; Pineault et al., 2016). ACOs are comprised of a variety of specialists and facility partnerships contractually committed to supporting care delivery for ACO beneficiaries. Studies showed that providers believed collaborative partnerships might mediate resource constraints tied to their practice size (Kim et al., 2017). As such, my study supported their summation and found no statistical significance between the number of primary care providers in an ACO and their performance with ACO #19. Thus, collaboration may have mediated variances related to practice size constraints. Previous research also suggested that ACO performance flattened after the initial ACO period. This could also account for some similarities in ACO performance across the target population.

My findings showed that the total number of patients in an ACO had a statistically significant correlation to ACO #19 performance. This aligned with previous research that practice size as defined by the number of patients predicted success with CMS quality measurements (Greene et al., 2015). Furthermore, previous research showed disparities across socioeconomic and racial/ethnic boundaries (Bromley et al., 2015). I found a statistically significant correlation that more non-White patients in an ACO resulted in lower performance scores. This aligned with previous studies where non-White patients were less likely to complete CRC screening (Basch et al., 2016; Bromley et al., 2015; Hall et al., 2016; Kiviniemi et al., 2018; Klabunde et al., 2015; Mastrokostas et al., 2018). Thus, the results supported a growing body of evidence that documented disproportionate racial and socioeconomic disparities for patient compliance (Ashktorab et al., 2017; Bromley et al., 2015; Burnett-Hartman et al., 2016; Chablani et al., 2017).

Interpretation in the Context of the Socioecological Model

My study was guided by the SEM. Under the SEM, provider performance is affected by factors that influence both their decision making and their effectiveness to change patient behavior (Rabarison et al., 2013). My findings showed that participation in an ACO and practice size may influence provider effectiveness to change patient behavior. Furthermore, the findings demonstrate factors related to the characteristics of their patients influences their effectiveness. Society/policy factors tied to creating ACOs and their CMS quality measurements (i.e., success defined by a score of at least 30 for ACO #19) are also influential.

Limitations

There are limitations to my study. First, I excluded new ACOs from the full analysis. Thus, the range of performance of the sample population (n = 140) may not reflect the distribution of the entire ACO base (n = 470). Nor may it reflect provider patient relationships for providers and patients that do not participate in ACOs. Caution should be used when generalizing these results for other applications. Second, the MSSP PUF file data are restricted to the variables within the data set.

The file does not provide CRC screening results at the individual level for patients or providers. Thus, my findings are limited to generalizations about ACOs based on total number of providers, total number of patients, and percentages of patients with certain characteristics. As a result, I am unable to articulate differences in ACO #19 compliance at the individual patient and rely instead solely on the ACO #19 performance score. I am also unable to articulate difference at the individual provider level. Lastly, the MSSP PUF has a one-year delay in reporting. The results were provided before the significant change in care delivery due to the COVID-19 pandemic and may influence the generalizability for future applications.

Implications

ACOs are partnerships among care providers including public health organizations. My study can improve public health and healthcare professionals' ability to influence the behaviors and health outcomes of the community members they serve. This is a vital component of current efforts to screen for COVID-19, promote adoption of behaviors to slow the spread of COVID-19 and adoption of COVID-19 vaccinations. The

CMS (2012) stated that more than 70% of patients over the age of 65 have two or more chronic conditions. The management of patients with multiple chronic diseases is more difficult than in those suffering from a single condition (Wagner et al., 2013). Wang et al., observed (2020) that elderly COVID-19 patients were among the most severe to critical cases with a high rate of fatality. Thus, the results of my study apply to current efforts for high risk elderly patients, their providers, and communities

Cancer screening rates have declined due to the COVID-19 pandemic (Carethers et al., 2020). The COVID-19 pandemic disproportionality affected minority communities and further resulted in even lower screening rates for minority populations (Carethers et al.). As such, Carethers et al., posit that extended delays in cancer screening is expected to lead to increase cancer for all populations. This is expected to be elevated in minorities and lower socio-economic people. My study offers insight as to which populations may be at greater risk based on their previous experience with CRC screening before the pandemic.

My study showed that ACOs with more patients were more compliant with CRC screening recommendations. Yet, it showed that ACOs with more Black patients were less compliant than those with less. It also revealed that the number of providers in an ACO did not influence compliance with CRC screening recommendations. My findings supported previous research that showed disparities among non-White patient populations. My research helps to decrease the prevalence of CRC and by doing so reduce the economic and quality of life burden for individuals and communities affected

by the disease. Moreover, my study helps to reduce disparities for CRC screening and incidence of CRC among vulnerable populations.

My study promotes positive social change by providing a foundation for population health initiatives beyond CRC related illness Thus, improving the wellbeing of communities and increase public health emergency preparedness. It provides meaningful data to the public health and health care provider partnerships engaged in transforming healthcare from a transactional delivery system to an evidence-based system of value (Berenson et al., 2016). It will influence policies that support health and wellness initiatives in communities of color. Furthermore, it will influence policies that govern the minimum number of patients in ACOs that might influence CRC screening rates for elderly patients. Furthermore, it can influence policy related to provider patient ratios and patients aged 65 year and older ...

Lastly, my study can offer guidance to public health and healthcare provider leaders on ways to train professionals better, reduce frustration, improve success and achieve higher levels of satisfaction in their work both in routine interventions and public health emergencies.

Recommendations

Several recommendations resulted for additional research from my study. Additional analysis should be conducted for further assessment of ACO #19 performance related patient base characteristics, age, race, sex, and socio-economic status. Second, CRC screening is the most complex behavior measured for ACOs. These include a variety of tests some of which have multiple compliance steps like those with

colonoscopy screening. This contrasts with dichotomous behaviors such as receiving a flu-vaccinations. I recommend future studies to compare complex behavior such as CRC with dichotomous decision like receiving an influenza vaccination.

The study should also be replicated for all 470 ACO participants. This may provide insight on differences and similarities to new and experienced ACOs. The study should also include provider feedback using tool like the primary care provider Behavioral Health Intervention Survey. The original tool was designed to assess provider perceptions of factors that influence their intention to use interventions when treating children with mental health problems and can be modified for adults (Arora et al., 2016).

Lastly the study should be replicated and expanded as a mixed methods explanatory sequential study. Mixed methods integrates open-ended qualitative data with closed-ended quantitative data from inquiry (Creswell, 2009). Mixed methods strategy is purpose-driven research to provide a more in-depth insight into how health professionals influence participant behavior (Creswell, 2009). Mixed methods can develop a more comprehensive understanding of changes needed for population engagement as well as understanding the process and outcomes of current patient engagement strategies (Creswell, 2009).

Conclusion

Health care delivery and public health have overlapping efforts like health screening activities for better health outcomes and to lower the burden of disease (Cunningham et al., 2020). Partnerships between community-based organizations, health care delivery and public health organizations improve public health outcomes. Studies

showed patient behavior was the key to improve quality and health outcomes (Mogre et al., 2019).

The MSSP ACO is partnership based advanced payment model designed to curb cost and improve patient outcomes for colon cancer among other disease measures. CRC is a leading cause of death in the United States, (Loyd, 2016) and more research is needed to determine the impact of MSSP ACO providers on CRC screening.

Previous research found disparities in health behavior recommendation compliance among people based on patient base characteristics and the size of their providers' practices (Kiviniemi et al., 2018; Manteuffel et al., 2014). My study sought to determine the relationship between practice size and compliance with MSSP performance measure for colonoscopy screening ACO #19. I explored practice size as the number of primary care providers and the total number of patients. My findings correlate with previous research around physician influence on paitent behavior and patient compliance with physician recommendations. My results showed that the number of primary care physicians in an ACO did not influence their ACO #19 score. Thus, their participation and collaboratoin in an ACO may have mediated some of the contraints found in other studies based on practice that could influence ACO performance. My study found that ACOs with more patients performed better. This aligned with previous research where practice size as defined by the number of patients predicted success with CMS quality measurements. However, performance declined as the number and percentage of minority patients increased. This aligned with previous research which showed disparities exist across socioeconomic and racial/ethnic boundaries.

My study addressed the gap in research by focusing on participant behavior of ACOs with different size patient populations and the number of primary care providers in their organizations. It contributes to positive social change by providing meaningful data to public health partnerships and policy makers that determine the size and structure of ACOs. Therefore, the application of my findings can improve the ability of public health and healthcare providers to predict their influence the behaviors and health outcomes of the community members they serve.

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Provider Influence on Patient Behavior Related the Population's Race, Age, and Gender

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Objective: This study assessed the preventative quality performance measure (ACO #19) for colon cancer screening under Medicare Shared Savings Plan ACO guidelines. I quantified the overall performance of ACO #19 based on the population's demographics of race, age and gender.

Methods: A cross-sectional quantitative study was conducted for organizations who participate as a Medicare Shared Savings Plan Accountable Care Organization. The research included secondary data analysis of the 2019 Medicare Shared Savings Plan PUF on quality performance.

Outlet for Manuscript

The *American Journal of Public Health* (AJPH) is the intended journal for this manuscript (https://ajph.aphapublications.org/). The initial submission requires a title page with the manuscript title, author name and affiliations, and full abstract and the manuscript with author and university information removed. In addition, the manuscript should contain the following elements:

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b. page numbers
c. numbered lines (in Word, > Page Setup > Line Numbers > Continuous) throughout the text of the manuscript;
d. 1.5 or double spacing with a font size of 12
e. tables and figures embedded at the end of the manuscript, OR uploaded as separate files

Submission also requires a cover letter with concise text (maximum 150 words) that provides a description of what the paper adds to the knowledge on the topic, especially in respect to material previously published in the journal and elsewhere; includes the public health importance of the paper; and highlights the main message of the paper in one sentence. With the exception of history essays, all AJPH articles follow the AMA Manual of Style, 10th Edition. Substantive notes and footnotes are not permitted.

Abstract

Public health efforts include initiatives like vaccination and screening to reduce the burden of disease. This study used the socioecological model and a cross-sectional quantitative design to assess data from the Medicare Shared Savings Plan public use file 2019 to examine patient behavior as the primary driver to improve healthcare quality and reduce costs. This study focused on colorectal cancer (CRC) screening behaviors of accountable care organization (ACO) patients based on the age, gender, and race differences of the patient population. ACOs with more non-White patients were less successful with CRC screening, and performance was highest when more patients were between 65-85 years of age when compared to patients under 65 or over 85 years old. The implications for positive social change in this study include data for policy makers, health, and public health care professionals to reduce disparities for CRC screening and incidence of CRC among vulnerable populations. Therefore, the application of the findings can improve the ability of public health and healthcare providers to predict their influence on behavior and health outcomes of the community members they serve. Furthermore, the study supports policies and processes around cultural awareness and cultural competencies to contribute to better healthcare delivery.

Introduction

Healthcare costs in the United States are rising at an unsustainable rate (Noble et al., 2014), and significant disparities in health outcomes exist across the U.S. population attributed mainly to social determinants of health (Foo et al., 2017). As a result, public, community and clinical health professionals in several communities formed partnerships under new public healthcare delivery models designed to improve public health by addressing social determinants of health and changing individual behavior (Bachrach et al., 2016; Noble et al., 2014). For example, the Institute of Healthcare Improvement's Quadruple Aim outlined a framework to improve health outcomes, lower healthcare costs, improve patient experience, and improve clinician satisfaction (Wagner et al., 2018). In fact, experimental alternative payment delivery models (APMs) were created with varying success to achieve components of the Quadruple Aim (Noble et al., 2014). Studies have shown that improvements in population engagement led to better health outcomes (Simmons et al., 2014). Population engagement by providers is essential to guide community members toward behaviors that lead to healthier outcomes, which may reduce the overall cost of care (Grand et al., 2014). However, there was little evidence of which strategies were most successful at influencing their patients' behavior.

Problem

Physicians have suggested that patient behavior is the key to improve health quality and outcomes, yet it is difficult to influence individual behavior (Hibbard et al., 2015). Moreover, researchers have found disparities in patient compliance with health behavior recommendations (Kiviniemi et al., 2018; Manteuffel et al., 2014), which are

linked to patient characteristics and provider variables like the size of provider practices (Kiviniemi et al., 2018; Manteuffel et al., 2014) Data on the patient experience are captured in performance reporting through the Centers for Medicare and Medicaid Services (CMS, n.d.), and patient perspectives toward patient engagement were well documented in the literature (Rowland et al., 2017). However, provider experiences, perceptions, success, and strategies to engage community members attributed to their APMs has not been represented in detail in previous research (Andrealli et al., 2018; Bekmuratova et al., 2019; Berenson et al., 2016; Chen et al., 2016). Thus, there is an inability to replicate the best practices for population engagement, that improve participant experiences, job satisfaction, health outcomes, and lower costs. To address this gap, I explored the preventative quality performance measure for colon cancer screening ACO #19 for the Medicare Shared Savings Plan (MSSP) guidelines based on race, age, and gender of the patient population.

Significance of the Study

APMs introduced patient engagement initiatives to lower the U.S. healthcare costs with different levels of success (Noble et al., 2014). Significant disparities in health outcomes exist across the U.S. population attributed mainly to social determinants of health (Foo et al., 2017). Extensive quantitative data on APM quality are captured by CMS performance reports (CMS, n.d.). The literature, however, lacks evidence as to why physicians were successful at influencing patient behavior. One study of an emerging United Kingdom healthcare model showed that the number of focus groups was increased when providers received payments to develop community-based participatory patient

focus groups to improve provider care delivery, but the quality of care was not improved (Smiddy et al., 2015). In the current study, exploring provider experiences with managing patient populations of different ages, genders, and ethnicities might explain to what degree they effect patient behavior compared to the measures that determine their payments.

Relevant Contribution to the Body of Knowledge

The purpose of my study was to assess the relationship between an ACO population's demographics race, age, and provider effectiveness at influencing patient behavior as measured by the compliance of MSSP performance measure ACO #19. This manuscript addresses a gap in research by focusing on provider practice characteristics based on age, gender, and race. This manuscript is a cross-sectional quantitative study to explore the preventative quality performance for colon cancer screening under MSSP ACO guidelines based on the described social determinants of health distribution of the patient population. My cross-sectional study provides a more comprehensive assessment of physician influence on patient behavior than studies like those from CMS.

Framework

The socioecological model (SEM) guided my cross-sectional quantitative study. I assessed data from the MSSP public use file (PUF). Under the SEM, provider performance is affected by factors that influence both their decision making and their effectiveness to change patient behavior (Rabarison et al., 2013). SEM posits five categorical levels which affect behavior change: the individual, interpersonal, organizational, community/environment, and society/policy levels (Lampard et al., 2013).

While the factors of the SEM are hierarchical, they are also integrated, and a change in one area could impact others (Coreil, 2009).

The positivist ontology also guides my study. Positivism implies that there is a single truth (Burkholder et al., 2016). Medicare reports ACO #19 measure attainment through a PUF. Thus, these results reflect a single truth of their performance. My study assessed how patients' race, age, and gender predicts providers' ACO #19 measure attainment. These findings are the source of truth under the positivist ontology for my study

My research is influenced by multiple contexts. The personal contexts for my study include my knowledge and experience with advance payment models and patient engagement. The social contexts include CMS guidelines, the fluidity of US healthcare policy, political climate, geographic locations, and local healthcare delivery priorities. Lastly, interpersonal contexts include Walden University dissertation committee representatives.

The definition of "provider success" is precise and supports a quantitative ontology of positivism where there is one true reality (Burkholder et al., 2016). Positivism guided my cross-sectional quantitative study to answer the question "How effective were providers at influencing patient behavior based on the performance measure ACO #19 of the Medicaid Shared Savings Plan?" I analyzed archival data from the CMS to support the positivist approach to my research question (Burkholder et al., 2016).

Background

Colorectal cancer (CRC) is a leading cause of death in the United States (Lloyd, 2016). The Centers for Disease Control and Prevention estimated over 40,000 deaths attributed to colon cancer in 2016 (Bachman et al., 2018). The risk of CRC mortality can be reduced with early detection (Lloyd, 2016). Focused efforts to increase CRC screening led to a reduction of CRC related deaths in the last decade; yet, several disparities continue to exist across socioeconomic and racial/ethnic boundaries (Bromley et al., 2015). Klabunde et al. (2015) reported that almost 25% of adults between 76 and 84 did not meet the U.S. Preventative Services Task Force recommendations for CRC screening before the advent of Medicare ACOs.

APMs were created to fight rising health care costs in the United States (Noble et al., 2014). ACOs are one of the advanced payment models designed to shift the focus of healthcare services from a traditional fee for service structure to a value-based care model. CRC screening is a key focus and measurement of ACOs. The propensity for provider recommendations for appropriate screening based on the Preventative Services Task Force recommendations for CRC screening was very low before the advent of Medicare ACOs (Klabunde et al., 2015). This problem was further exacerbated by racial disparities where African American and Hispanic individuals were less likely to complete screening and had an increased prevalence of adverse health outcomes as a result (Klabunde et al., 2015).

A growing body of evidence among other research further documented disproportionate racial and socioeconomic disparities and highlighted the diverse cultural

needs to motivate patients toward compliance (Ashktorab et al., 2017; Bromley et al., 2015; Burnett-Hartman et al., 2016; Chablani et al., 2017). Many studies offered anecdotal patient interventions that improved patient compliance (Nathan et al., 2016; Singal et al., 2017; Slyne et al., 2017). Studies that focused on patient experience reinforced culturally competent approaches based on varying patient demographics (Alsayid et al., 2019; Brittain & Murphy, 2015; Chen et al., 2016).

Fear was demonstrated to be a major influence for compliance by all patients, but particularly among blacks and Hispanics (Basch et al., 2016; Bromley et al., 2015; Hall et al., 2016; Kiviniemi et al., 2018; Mastrokostas et al., 2018). Fear emerged as fear of both fear of undergoing the procedure and fear of the procedure's findings (Bromley et al., 2015). Ineffective communication and perceived provider uncertainty also affected the patient decision-making process (Beverly et al., 2016). This was confounded by patients' expectations of the provider (Alspach, 2018; Mast & Kadji, 2018). For example, uncertainty was seen as a form of truthfulness for female providers, whereas the trait generated mistrust for male providers (Mast & Kadji, 2018). Moreover, trust was demonstrated to be a contributing factor behind non-compliance of CRC screening for many Hispanic patients (Hong et al., 2018). Studies also showed providers adherence to evidence-based treatment guidelines differed when treating men vs women (Manteuffel et al., 2014). Still more evidence reported unconscious bias by providers when treating patients of different race, age, and socioeconomic groups. (Williams et al., 2015).

Medicare recognizes four methods of colonoscopy screening to demonstrate compliance with the ACO #19 measure (Prince et al., 2017). These include colonoscopy,

DNA, stool testing, and fecal occult blood test. Studies suggest CRC compliance varies with the type of test offered, Thus, could impact the CRC screening recommendations that providers make to their patients (Alsayid et al., 2019; Basch et al., 2016; Bian et al., 2016; Brenner & Chen, 2017; Bromley et al., 2015; Chambers et al., 2016).

Colonoscopy is the most popular forms of CRC screening, and includes multiple steps like scheduling, bowel preparation, sedation and the procedure itself; some of which contain multiple levels of compliance (Powers & Keohane, 2018). Some of steps to obtain a colonoscopy contain multiple levels of compliance and complexity themselves (Powers et al., 2018). For example, strategies such as enhanced written education, media campaigns, and videos improved compliance with the bowel preparation step for colonoscopies (Andrealli et al., 2018; Cole et al., 2019; Essink-Bot et al., 2016). However, they were demonstrated as less effective to improve patient health literacy and compliance to complete a colonoscopy procedure (Clark et al., 2017; Enard et al., 2015; Mishra et al., 2018).

Success varied among the initial United States APMs (Noble et al., 2014). Hibbard et al. (2015) documented that compensation from APMs in other countries influenced physician opinions on the importance of patient behavior. They further provided evidence that patient behavior was the primary driver of improving quality (Hibbard et al., 2015). Other studies showed that improvements in patient engagement lead to better health outcomes (Grand et al., 2014; Simmons et al., 2014).

Physicians in the United States agreed that patient behavior was the key determinant to improve quality and outcomes, yet, many found frustration when they

tried to influence individual behavior (Hibbard et al., 2015). While many providers perceived their role within the community and in population health as “medicine-based”; a growing emphasis on preventative care and the complex characteristics of their attributed patient base fostered better collaboration between healthcare providers and traditional public health organizations (Ingram et al., 2015). This was particularly true for mutual objectives such as cancer prevention (Basch et al., 2016).

Nyweide et al. (2015) showed the initial performance under the Medicare ACO model reduced healthcare expenditures for the attributed population base when compared to traditional Medicare fee-for-service beneficiaries. The CMS measures ACO providers across four domains, which include care coordination, patient safety, patient experience, and preventative health (Modi et al., 2018). Providers are rewarded for lower cost of patient care and achieving quality metrics outlined in their ACO contracts.

Studies documented provider perceptions of barriers and provider characteristics that influenced their decision making and success (Mastrokostas et al., 2018; Wang et al., 2018). These included the basic ability to verify patient’s correct CRC status and the clinician’s ability to confer with specialists (Mastrokostas et al., 2018) For example, a provider recommendation was a primary influence on whether patients of all demographic groups participated in CRC screenings (Bian et al., 2016; Bromley et al., 2015). Some studies showed that health information technologies that shared patient information or alerted providers to the patient’s CRC risk and screening status nudged providers to provide CRC screening recommendations (Kim et al., 2017b; Mankaney et al., 2019). Additionally, other studies reiterated the importance of Patient Behavior on

quality performance and the need to implement systems to support patient engagement activities to influence behavior (Mishra et al., 2018). These included the concepts of, motivational interviewing, goal setting, and shared decision making (Mishra et al., 2018). However, Mishra and colleagues (2018) reported that providers were aware of these concepts but often lacked the depth of understanding and practice to implement them in a meaningful way. Shapiro et al. (2018) further described provider experiences with tough to manage patients in which providers described themselves as anxious, frustrated, and uncertain with little preparation for how to handle difficult patients. My study addressed a gap in research and focused on the patient attribution characteristics and provider strategies that influence the behavior of APM patients to achieve compliance with CRC screening recommendations.

Research Question and Design

The nature of the manuscript is a cross-sectional quantitative study for the following research questions:

Based on the performance measures of the MSSP, what is the relationship between the ACO population's demographics race, age, and how effective providers are at influencing patient behavior as measured by the compliance of MSSP performance measure ACO #19?

H_0*:* There are no statistically significant differences in compliance of MSSP performance measure ACO #19 based on the ACO population's demographics, race, age, and gender.

H_a: There are statistically significant differences in compliance of MSSP performance measure ACO #19 based on the ACO population's demographics, race, age, and gender.

Cross-sectional quantitative studies are descriptive research to describe community characteristics at a single point in time. I analyzed data from the MSSP PUF from 2019. I assessed the relationship of dependent variable ACO performance for measure ACO #19 and the independent variables race, age and gender. My research design required a way of to measure patient behavior. CMS ACO #19 is a cumulative measure based on the number of people that participated in CRC screening. Therefore, I assumed that CMS data is a valid measure of patient behavior.

Methods

Operational Definitions

ACO #19: Percentage of adults between 50–75 years of age who had appropriate screening for CRC for ACO quality reporting (CMS, 2017).

Alternative payment delivery models (APMs): Several experimental advance/APMs have been created with varying success to introduce new patient engagement initiatives to combat the United States skyrocketing healthcare costs (Noble et al., 2014).

Attribution: The patients assigned to the health care provider for which they are being measured (Noble et al., 2014).

Patient engagement: Studies show that improvements in patient engagement lead to better health outcomes (Simmons et al., 2014).

Practice size: The number of patients and the number of primary care physicians in an ACO.

Bias and Limitations

I analyzed archived data from the CMS. Therefore, the quality of this quantitative data source was beyond my control as the researcher and contingent on the data collection process for MSSP reporting (Burkholder et al., 2016). CMS (2017) allows providers to review and dispute published performance data, followed by a final CMS ruling. I used the final report issued by CMS, which included corrections to improve data quality. But I could not control confounding variables that may influence provider–patient attribution (Noble et al., 2014). These included patient comorbidities that can affect patients abilities to comply with healthcare treatment plans (DeJean et al., 2013).

Scope and Delimitations

The MSSP ACO PUF details physician performance against 32 measures across four domains (CMS, n.d.). The results are the official CMS findings and used to pay provider incentives (Noble et al., 2014). Therefore, these measures are valid representations of physician performance. The scope of my study was to evaluate physicians' performance against the CMS measurement for colon cancer screening ACO #19.

I limited my target population to the subset of organizations that had previous experience with MSSP ACOs and those who reported data for the 2019 MSSP reporting year. Excluding first-year MSSP participants improved credibility by ensuring that providers in the sample had a baseline measurement that reflected their performance

better (Noble et al., 2016). Disparities in provider–patient interactions may be influenced by the factors race and patient insurance coverage (Foo et al., 2017). Therefore, a third delimitation limited the participatn sample to those with a patient base with at least 10% non-White and accept both Medicaid and Medicare patients (CMS, 2017). Succesful attainmnet of ACO #19 was detrmined by a score of at least 30% (CMS, 2017). I differentiated well-performing providers from poor performing using this recognized benchmark as a fourth delimitation (CMS, 2017).

Design

Positivism guided the cross-sectional quantitative study to answer the question, "How effective are providers at influencing patient behavior based on the performance measure ACO #19 of the Medicaid Shared Savings Plan?" Archival data analysis from the CMS 2019 MSSP PUF supported the positivist approach to my research question. I used the quality performance data for healthcare providers reported in the PUF to determine their effectiveness at influencing patient behavior as it correlated to their practice size.

Instrumentation

Archival data from the MSSP PUF for 2019 was used for the data collection process. The MSSP ACO PUF was derived from a combination of provider claims and survey data. The PUF files are available for performance years 2013-2019. The PUF file included hundreds of variables, descriptions and performance measure outcomes. These included measures for six behavior related preventative measures. Performance measures

were captured as a percent of the total population where a higher score means higher performance for that measure.

Provider incentives for MSSP ACOs were based on quantitative analysis of their performance against established benchmarks (Noble et al., 2014). As such the current reporting for the effectiveness of APMs is dichotomous as the providers did or did not meet their measurement objectives (CMS, n.d.). This clear determination of provider success supports a quantitative ontology of positivism in which there is one true reality (Burkholder et al., 2016). Furthermore, quantitative analysis of provider performance using MSSP public use data is an accepted practice among the healthcare community (Noble et al., 2016).

Participants

I limited the evaluation of provider performance to organizations in the United States who had previous ACO experience prior to 2019 and who reported data for the 2019 MSSP reporting year. Previous studies showed that providers treated patients differently according to sociodemographic characteristics (Foo et al., 2017; Manteuffel et al., 2014). Therefore, I restricted participants to ACOs with a patient base of at least 10% non-White and who accepted both Medicaid and Medicare patients. Furthermore, CMS set a minimum standard of 30% achievement to comply with MSSP guidelines. Therefore, participant selection was based on provider performance compared to the 30% benchmark.

Data Sources

Archival data was reviewed from the MSSP PUF for 2019. I used data for new and returning ACO participants from the 2019 MSSP PUF. I described the extent that ACOs were successful with measure ACO #19. I uploaded the entire MSSP PUF database into SPSS v25 for review, analysis, and statistical testing.

Quantitative Collection and Analysis

I assessed how effective ACOs were at changing patient behavior. I described the extent that ACOs were successful at achieving colon cancer screening for measure ACO #19. I uploaded the entire 2019 MSSP PUF database into SPSS v25 for review, analysis and statistical testing. I retained the native MSSP PUF document, which was uploaded multiple times with all statistical tests replicated to ensure integrity and reliability. I used Pearson Correlation and linear regression to determine if there was a significant relationship between ACO practice size and performance. The level of significance was set to 0.05.

Results

Research question: Based on the performance measures of the MSSP, what is the relationship between the ACO population's demographics race, age, and gender and compliance with MSSP performance measure ACO #19?

H_0: There are no statistically significant differences in compliance with MSSP performance measure ACO #19 based on the ACO population's demographics, race, age, and gender.

H_a: There are statistically significant differences in compliance with MSSP performance measure ACO #19 based on the ACO population's demographics, race, age, and gender.

Execution

Archival data from the MSSP PUF (CMS, n.d.) for 2019 were assessed for 470 ACOs. I calculated an additional variable to reflect the attribution percentages for race, age, gender, and Medicaid status in Microsoft Excel. The modified file was then entered into SPSS version 25 to organize, code, and screen data. Data for ACO #19 score and number of primary care providers were recoded to ordinal categorical data. Values were calculated including frequency counts and percentages with SPSS. Descriptive data analysis was performed for frequencies for all ACOs.

The final sample size was narrowed to 140 ACOs based on the inclusion and exclusion criteria for the study. These included previous experience in the MSSP program and an ACO #19 score of 30 or more, an attribution that was at least 10% non-White. I performed statistical assumption tests for normal distribution, homoscedasticity, and linearity between dependent and independent variables before research question analysis. Table 7 summarizes the dependent, independent variables, and statistical analyses used to evaluate the research questions.

Table 7

Variables and Statistical Tests Used to Evaluate Research Questions

Research Question	Dependent Variable	Independent Variable	Analysis
What is the relationship between practice size and compliance with MSSP performance measure ACO #19?	ACO #19 Score	Attribution Characteristics: Age Attribution Characteristics: Race Attribution Characteristics: Gender	Pearson Correlation Linear Regression

Note. ACO = accountable care organization

Descriptive Statistics for all ACOs

Descriptive analysis for all (n = 470) ACOs and the target sample (n = 140) were conducted for ACO #19 performance. Frequencies were reviewed for practice size and characteristics of ACO attributions for age, race, gender, and insurance. Table 8 shows the ACO #19 performance with most organizations achieving between 50% and 90%. Performance for the target population aligned with the larger base with most organizations (n = 85) achieving between 70–89% followed by those between 50-69% (n = 47).

Table 8

ACO #19 Performance Range and Frequency

	All ACOs		Target ACOs	
ACO #19 Score	Frequency	Percent	Frequency	Percent
0-29	4	0.9		
30-49	13	2.8	4	2.9
50-69	157	33.4	47	33.6
70-89	287	61.1	85	60.7
90 to 100	9	1.9	4	2.9
Total	470	100.0	140	100.0

Note. ACO = accountable care organization

Practice size as measured by primary care physicians ranged from 20 to 2,299. Table 9 shows that most ACOs had less than 200 primary care providers with the majority falling between 50-99 at roughly 22%.

Table 9

Range and Frequency of Primary Care Providers in ACOs

	All ACOs		Target ACOs	
Primary Care Providers	Frequency	Percent	Frequency	Percent
0-49	72	15.3	15	10.7
50-99	101	21.5	32	22.9
100-149	74	15.7	18	12.9
150-199	41	8.7	11	7.9
200-249	30	6.4	9	6.4
250-299	25	5.3	9	6.4
300-349	15	3.2	5	3.6
350-399	16	3.4	6	4.3
400-499	30	6.4	8	5.7
500-599	16	3.4	7	5.0
600 or more	50	10.6	20	14.3
Total	470	100.0	140	100.0

Note. ACO = accountable care organization

Table 10 shows the practice size characteristics based on patient attribution for all ACOs. ACOs that did not report a score for ACO #19 (n = 4) were removed. Of the remaining (n = 466) there was a total of 9,918,470 patients enrolled in the ACOs of which 4,275,182 (43%) were male and 5,643,285 (57%) female. Eighty-six percent of the population was white and 14% non-White. Ages ranged from 0-64 (14%), 65-74 (46%), 75-84 (28%) and 85 or older (12%). Beneficiaries with Medicaid totaled 606,989. The patient attribution for all ACOs ranged from 2,193 to 239,924 patients.

Table 10

Range and Percentage of Attributions Across all ACOs

	Minimum	Maximum	Sum	Percent
Total Patients	2,193	239,924	9,918,470	
Female	1,240	133,423	5,643,285	57%
Male	953	106,501	4,275,182	43%
Medicaid Patients	67	17,981	606,989	6%
Non-Medicaid Patients	1,346	181,135	7,917,736	80%
Total Age 0_64	262	41,238	1,369,626	14%
Total Age 65_74	817	109,019	4,607,276	46%
Total Age 75_84	619	64,190	2,799,157	28%
Total Age 85Plus	186	25,477	1,142,411	12%
White	479	219,069	8,519,870	86%
Non-White	97	24,215	1,398,600	14%

Note. ACO = accountable care organization

The attribution of most ACOs in the target population was under 40,000 patients. Table 11 shows that over half of the ACOs carried an attribution of between 10,000 and 39,999 followed by a range of 2,193 to 9,999 (27%).

Table 11

Range and Percentage of Attribution

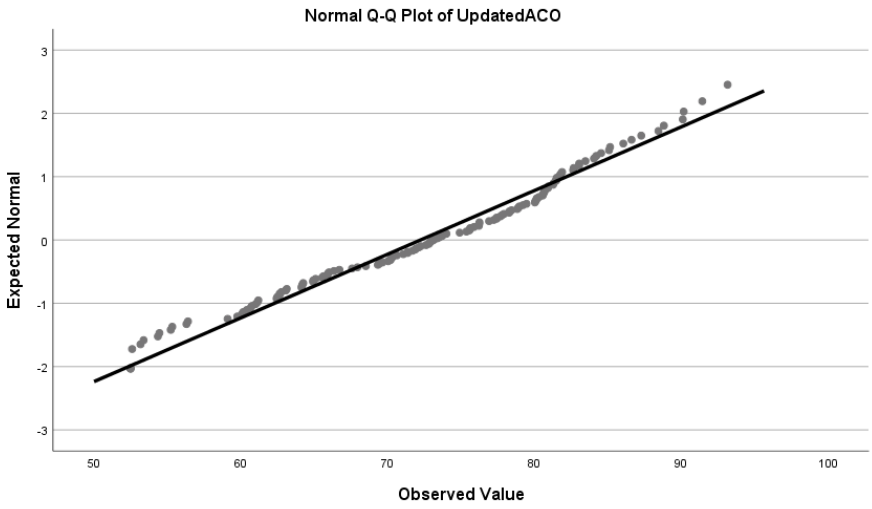
Attribution Range	Frequency	Percent
0-9,999	38	27.1
10,000-39,999	77	55.0
40,000-79,999	19	13.6
80,000 or more	6	4.3
Total	140	100.0

Tests of Assumptions

I conducted assumption tests of the dependent variable ACO #19. The data were normally distributed and follow a normal distribution curve. The skewness and kurtosis tests for normal distribution should fall between the rage of ± 2 and ±7 respectfully. The ACO #19 score data for skewness was -.287 and kurtosis was -.692. The Kolmogorov-Smirnov test for normality was insignificant at .058. Figure three shows the normal Q-Q plot of the data.

Figure 3

Normal Q-Q Plot for ACO #19 Performance



Note. ACO = accountable care organization

Inferential Statistics Manuscript 2

I found that age and race characteristics of patients in an ACO had a statistically significant influence on ACO #19 performance. Thus, the null hypothesis that age and race do not have a significant influence on ACO #19 performance was rejected. Gender did not significantly influence ACO #19 performance. The null hypothesis that gender does not influence ACO #19 performance was accepted. I used bivariate correlation to determine the relationship between the dependent variable ACO #19 performance and independent variables for age, gender and race.

Age

Table 12 shows the correlations between age and ACO #19 performance. The total number of patients in an ACO that were between 0-64 years old was not a significant influence on ACO #19 performance. The total number of patients between the

age of 65-74 was statistically significant with a positive correlation of .228 and $p = .007$. The total number of patients between the age of 75-84 also had a positive correlation of .240 and $p = .004$. The total number of patients over the age of 85 had a positive correlation of .211 and $p = .012$.

The percentage of patients between 0-64 had a negative correlation of -.472 which was statistically significant at $p<.001$. The percent of patients between 65-74 had a positive correlation of .341 with $p<.001$. The percent of patients between 75-84 had a positive correlation of .448 with $p<.001$. The percent of patients 85 and over was not a significant influence on ACO #19 performance.

Table 12

Correlation Between Attribution Age and Performance

		Attribution Total	Age 0_64	Age 65_74	Age 75_84	Age 85Plus
ACO #19 Performance	Pearson Correlation		0.045	.228**	.240**	.211*
	P value		0.598	0.007	0.004	0.012
	N		140	140	140	140
		Attribution Percentage	Age 0_64	Age 65_74	Age 75_84	Age 85Plus
	Pearson Correlation		-.472**	.341**	.448**	0.087
	P value		0.000	0.000	0.000	0.307
	N		140	140	140	140

Gender

Both the total number of male and the total number of female patients showed a positive correlation that was statistically significant. However, this measure correlates to the total number of patients in an ACO which was found to be statistically significant in a

previous study. Alternatively, the percentages of male and female patients did not show a statistically significant correlation on ACO #19 performance.

Race

Table 13 shows the correlations between race and ACO #19 performance. The results showed statistically significant correlations for ACO #19 performance and total number of white patients in an ACO. The total of white patients in an ACO had a positive correlation of .244 with p = .244. The total of patients in an ACO that were a race other than, White, Black, Asian, Hispanic or Native American also had a positive correlation with ACO #19 performance of .167 and p=0.049.

The percent of the total patients in an ACO that were white had a positive correlation with ACO #19 performance of .416 and p=0.00. The percent of Black and Hispanic patient in the ACO had negative correlations with ACO #19 performance. The percent of black patients had a negative correlation of -.365 and p = .00. The percent of Hispanic patients had a negative correlation of -.222 and p = .008.

Table 13

Correlation Between Attribution Race and CRC Screening

Attribution Total	White	Black	Asian	Hispanic	Native American	Other Race	Non-White
Pearson Correlation	.244**	-0.027	-0.047	-0.004	0.012	.167*	0.014
P value	0.004	0.756	0.578	0.967	0.887	0.049	0.871
N	140	140	140	140	140	140	140
Attribution Percentage	Percent White	Percent Black	Percent Asian	Percent Hispanic	Percent Native American	Percent Other Race	Non-White
Pearson Correlation	.416**	-.365**	-0.134	-.222**	-0.136	-0.069	-.416**
P value	0.000	0.000	0.114	0.008	0.109	0.420	0.000
N	140	140	140	140	140	140	140

Note. CRC = colorectal cancer

Linear Regression

I used linear regression to further analyze the correlations between ACO #19 performance and the number of patients in an ACO for each age category. The relationship was statistically significant *(*$F(4,135) = 5.84$, $p<.05$).The total patients in each age group attributed to the variance in ACO #19 performance by 14.8% with an R^2 value of .148 and an adjusted R^2 of .122.

ACO #19 score increased slightly as the total number of patients between the age of 75-84 increased with a coefficient of $B = .002$. Scores also increased with a coefficient of $B = 7.11$ as the number of patients between the age of 65-74 increased. There was a slight decrease in performance with $B = -.002$ as the total number of patients between 0-64 years old and over 85 years old increased.

The relationship between the percent of patients in each age group and ACO #19 performance was statistically significant *(*$F(3,136) = 16,650$,$p<.05$).These percentages had a higher influence of 26.9% of the variance with an R^2 of .269 and an adjusted R^2 of .252. ACO performance increased $B = .311$ as the percent of patients in the ACO

increased between the ages of 65-74 years old. Performance also increased B = 1.27 as the percent of patients increased between the age of 75-84 years of age. However, Performance decreased B = -.509 as the percent of patients 85 or older increased.

I used linear regression to further analyze the correlations between ACO #19 Performance and race. The relationship was statistically significant *(*$F(11,128)$, $p<.05$). Race attributed to the variance in performance by 27.2 % with an R^2 value of .272 and an adjusted R^2 of .210. ACO #19 performance improved with B = 6.4 as the number of White patients increased. Performance decreased slightly B = -.001 as the number of patients categorized as "Other" increased. Performance decreased B = -.804 and B = -.420 as the percentage of Hispanic and Black patients increased respectively.

Discussion

Interpretation

Almost 25% of adults between 76 and 84 did not meet the U.S. Preventative Services Task Force recommendations for CRC screening before the advent of Medicare ACOs (Klabunde et al., 2015). My findings showed that only four out of 470 ACOs did not meet the minimum performance score of 30 for ACO #19. However, 36% of the 140 target ACOs scored under 70%.

My overarching study showed the size of the ACO attribution had a statistically significant correlation to ACO #19 performance. This aligned with previous research that practice size as defined by the number of patients predicted success with CMS quality measurements (Greene et al., 2015). Results also supported compliance disparities between races (Ashktorab et al., 2017; Bromley et al., 2015; Burnett-Hartman et al.,

2016; Chablani et al., 2017), as I found a statistically significant correlation that more Black and Hispanic patients in an ACO resulted in lower performance scores. This aligned with previous studies where non-White patients were less likely to complete CRC screening (Basch et al., 2016; Bromley et al., 2015; Hall et al., 2016; Kiviniemi et al., 2018; Klabunde et al., 2015; Mastrokostas et al., 2018). Thus, ACOs that serve high numbers of minority patients experience lower quality performance than others (Lewis et al., 2017). This may correlate to research that showed lack of trust to be a contributing factor behind non-compliance of CRC screening for many Hispanic patients (Hong et al., 2018).

In addition to race, my study found statistically significant differences for ACOs with different age categories. This further supports findings of unconscious bias by providers when treating patients of different race, age and socioeconomic groups. (Williams et al., 2015). Other studies, however, found no relation to these characteristics and provider decisions (Haider et al., 2015). My study did not show a difference in ACO #19 performance based on gender. However, caution should be made when generalizing these results as they were not calculated at the individual patient or provider level.

Interpretation in the Context of the Socioecological Model

My study was guided by the SEM. Under the SEM, provider performance is affected by factors that influence both their decision making and their effectiveness to change patient behavior (Rabarison et al., 2013). My study showed that participation in an ACO and practice size as total patients and number of minorities may influence provider effectiveness to change patient behavior. Furthermore, factors related to the

characteristics of their patients may influence their effectiveness. Society/policy factors tied to creating ACOs and their CMS quality measurements (i.e., success defined by a score of at least 30 for ACO #19) are also influential. My research did not report findings related to socioeconomic make up. However, my overarching research demonstrated that a high percentage of patients with lower socioeconomic status negatively influence provider effectiveness.

Limitations

There are limitations to my study. First, I excluded new ACOs from the full analysis. Thus, the range of performance of the sample population (n = 140) may not reflect the distribution of the entire ACO base (n = 470). Nor may it reflect provider patient relationships for providers and patients that do not participate in ACOs. Caution should be used when generalizing these results for other applications. Second, the MSSP PUF file data are restricted to the variables within the data set. The file does not provide CRC screening results at the individual level for patients or providers. Thus, my findings are limited to generalizations about ACOs based on total number of providers, total number of patients, and percentages of patients with certain characteristics. As a result, I am unable to articulate differences in ACO #19 compliance at the individual patient and rely instead solely on the ACO #19 performance score. I am also unable to articulate difference at the individual provider level. Lastly, the MSSP PUF has a one-year delay in reporting. The results were provided before the significant change in care delivery due to the COVID-19 pandemic and may influence the generalizability for future applications.

Implications

Cancer screening rates have declined due to the COVID-19 pandemic (Carethers et al., 2020). The COVID-19 pandemic disproportionality affected minority communities and further resulted in even lower screening rates for minority populations (Carethers et al.). As such, Carethers et al., posit that extended delays in cancer screening is expected to lead to increase cancer for all populations. This is expected to be elevated in minorities and lower socio-economic people. My study offers insight as to which populations may be at greater risk based on their previous experience with CRC screening before the pandemic.

My findings supported previous research that showed disparities among non-White patient populations. It further demonstrated a lack of compliance with CRC screening where more patients in the population were either under 65 or over 85 years old. My research helps to decrease the prevalence of CRC and by doing so reduce the economic and quality of life burden for individuals and communities affected by the disease. Moreover, my study helps to reduce disparities for CRC screening and incidence of CRC among vulnerable populations.

My study promotes positive social change by providing a foundation for population health initiatives beyond CRC related illness Thus, improving the wellbeing of communities and increase public health emergency preparedness. It provides meaningful data to the public health and health care provider partnerships engaged in transforming healthcare from a transactional delivery system to an evidence-based system of value (Berenson et al., 2016). It will influence policies that support health and wellness

initiatives in communities of color and patients aged 65 year and older. ACOs are partnerships among care providers including public health organizations. My study can improve public health and healthcare professionals' ability to influence the behaviors and health outcomes of the community members they serve. This is a vital component of current efforts to screen for COVID-19, promote adoption of behaviors to slow the spread of COVID-19 and adoption of COVID-19 vaccinations. The CMS (2012) stated that more than 70% of patients over the age of 65 have two or more chronic conditions. The management of patients with multiple chronic diseases is more difficult than in those suffering from a single condition (Wagner et al., 2013). Wang et al., observed (2020) that elderly COVID-19 patients were among the most severe to critical cases with a high rate of fatality. Thus, the results of my study apply to current efforts for high risk elderly patients, their providers and communities.

Lastly, my study can offer guidance to public health and healthcare provider leaders on ways to train professionals better, reduce frustration, improve success and achieve higher levels of satisfaction in their work both in routine interventions and public health emergencies.

Recommendations

Several recommendations resulted for additional research from my study. Additional analysis should be conducted for further assessment of ACO #19 performance based the size of the ACO population and the number of providers participating in an ACO. The influence of insurance coverage particularly for lower socio-economic patients with Medicaid should be explored. Next, some CRC screenings are complex. These

include tests some which have multiple compliance steps like those with colonoscopy screening. This contrasts with dichotomous behaviors like receiving a flu-vaccination. I recommend future studies to compare complex behaviors such as CRC screening with dichotomous decisions like receiving an influenza vaccination.

The study should also be replicated for all 470 ACO participants. This may provide insight on differences and similarities to new and experienced ACOs. Future research could include provider feedback using tools like the primary care provider Behavioral Health Intervention Survey. The original tool was designed to assess provider perceptions of factors that influence their intention to use interventions when treating children with mental health problems and can be modified for adults (Arora et al., 2016).

Lastly the study could be replicated and expanded as a mixed methods explanatory sequential study. Mixed methods integrates open-ended qualitative data with closed-ended quantitative data from inquiry (Creswell, 2009). Mixed methods strategy is purpose-driven research to provide a more in-depth insight into how health professionals influence participant behavior (Creswell, 2009). Mixed methods can develop a more comprehensive understanding of changes needed for population engagement as well as understanding the process and outcomes of current patient engagement strategies (Creswell, 2009).

Conclusion

Health care delivery and public health have overlapping efforts like health screening activities for better health outcomes and to lower the burden of disease (Cunningham et al., 2020). Partnerships between community-based organizations, health

care delivery and public health organizations improve public health outcomes. Studies showed patient behavior was the key to improve quality and health outcomes (Mogre et al., 2019).

The MSSP ACO is partnership based advanced payment model designed to curb cost and improve patient outcomes for colon cancer among other disease measures. CRC is a leading cause of death in the United States, (Loyd, 2016) and more research is needed to determine the impact of MSSP ACO providers on CRC screening. Previous research found disparities in health behavior recommendation compliance among people based on patient base characteristics race, age and gender.

My quantitative study of 140 ACO participants sought to determine the relationship between these patient characteristics and compliance with MSSP performance measure for colonoscopy screening ACO #19. My findings correlate with previous research around physician influence on paitent behavior and patient compliance with physician recommendations. My findings showed differences in performance based on age and race but not for gender. Performance increased for ACOs with more patients between the age of 65-85 years old. However, performance declined as the number and percentage of non-White patients increased. This aligned with previous research which showed disparities exist across socioeconomic and racial/ethnic boundaries. The results did not show a difference in performance based on the gender makeup of the ACO population.

My study addressed the gap in research and focused on participant behavior of ACOs based on the racial, gender and age distribution of their patient populations. It

contributes to positive social change by providing meaningful data to public health partnerships and policy makers as to how these social determinants of health impact outcomes. Therefore, the application of my findings can improve the ability of public health and healthcare providers to predict their influence on behavior and health outcomes of the community members they serve. Furthermore, it supports policies and processes around cultural awareness and cultural competencies to contribute to better healthcare delivery.

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Provider Influence on Patient Behavior Related to Population Insurance Coverage

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Objective: This study assesses the preventative quality performance measure (ACO #19) for colon cancer screening under Medicare Shared Savings Plan ACO guidelines. I quantified the overall performance of ACO #19 based on the population's demographics of race, age, and gender.

Methods: A cross-sectional quantitative study was conducted for organizations who participate as a Medicare Shared Savings Plan Accountable Care Organization. The research included secondary data analysis of the 2019 Medicare Shared Savings Plan PUF on quality performance.

Outlet for Manuscript

The *American Journal of Public Health* (AJPH) is the intended journal for this manuscript (https://ajph.aphapublications.org/). The initial submission requires a title page with the manuscript title, author name and affiliations, and full abstract and the manuscript with author and university information removed. In addition, the manuscript should contain the following elements:

a. Title and abstract
b. page numbers
c. numbered lines (in Word, > Page Setup > Line Numbers > Continuous) throughout the text of the manuscript;
d. 1.5 or double spacing with a font size of 12
e. tables and figures embedded at the end of the manuscript, OR uploaded as separate files

Submission also requires a cover letter with concise text (maximum 150 words) that provides a description of what the paper adds to the knowledge on the topic, especially in respect to material previously published in the journal and elsewhere; includes the public health importance of the paper; and highlights the main message of the paper in one sentence. With the exception of history essays, all AJPH articles follow the AMA Manual of Style, 10th Edition. Substantive notes and footnotes are not permitted.

Abstract

Public health efforts to improve health include vaccination and screening initiatives to reduce the burden of disease. This study focused on colorectal cancer (CRC) screening behaviors of accountable care organization (ACO) patients with Medicaid and providers' ability to comply with the Medicare Shared Savings Plan (MSSP) quality measure ACO #19. This study used the socioecological model and a cross-sectional quantitative design to assess data from the MSSP public use file 2019 to expand on current literature that determined Medicaid patients experienced bias and obstacles while pursuing CRC screening. Furthermore, it supported previous research that patient behavior was the primary driver to improve healthcare quality and reduce costs. This study found ACOs with more Medicaid patients were also less successful with less Medicaid distribution. Success with CRC screening is influenced by factors like policies, funding sources, and external demands that guide decisions. Moreover, rising costs of the United States Healthcare system is a public health threat. This study contributes to positive social change by providing meaningful data to public health partnerships and policies that impact community health outcomes for lower socio-economic patients. The implications for positive social change in this study include data for policy makers, health, and public health care professionals to reduce disparities for CRC screening and incidence of CRC among vulnerable populations. Therefore, the application of my findings can improve the ability of public health and healthcare providers to predict their influence on behavior and health outcomes of the Medicaid beneficiaries they serve. The data also supports population health initiatives beyond CRC-related illness.

Introduction

Healthcare costs in the United States are rising at an unsustainable rate and include significant disparities in health outcomes attributed to social determinants (Foo et al., 2017; Noble et al., 2014). Public health agencies and clinical health organizations formed partnerships in several communities to form new public healthcare delivery models (Noble et al., 2014). These partnerships were designed to improve their population's health by influencing individual behavior and addressing social determinants of health (Bachrach et al., 2016; Noble et al., 2014). For example, the Institute of Healthcare Improvement's Quadruple Aim outlined a framework to improve health outcomes, lower healthcare costs, improve patient experience, and improve clinician satisfaction (Wagner et al., 2018). This contributed to the development of experimental alternative payment delivery models (APMs) to achieve components of the Quadruple Aim; however, these new designs have had varying degrees of success (Noble et al., 2014). Studies have shown that population engagement is essential to guide community members toward behaviors that lead to healthier outcomes, which could reduce the overall cost of care (Grand et al., 2014). However, there was little evidence of which strategies were most successful at influencing the population's behavior.

Problem

Patient behavior is the key to improve health quality and outcomes, yet many physicians have found it difficult to influence individual behavior (Hibbard et al., 2015). Moreover, researchers have found disparities in patient compliance with health behavior recommendations (Kiviniemi et al., 2018; Manteuffel et al., 2014) linked to patient

characteristics and provider variables like the size of provider practices (Kiviniemi et al., 2018; Manteuffel et al., 2014). Data on the patient experience are captured in performance reporting through the Centers for Medicare and Medicaid Services (CMS, n.d.). Furthermore, patient perspectives toward patient engagement are well documented in the literature (Rowland et al., 2017). However, provider experiences, perceptions, success, and strategies to engage community members attributed to their APMs have not been represented in previous research (Andrealli et al., 2018; Bekmuratova et al., 2019; Berenson et al., 2016; Chen et al., 2016). Thus, there is an inability to replicate the best practices for population engagement, that improve participant experiences, job satisfaction, health outcomes, and lower costs. This manuscript addressed a gap in research and focused on the relationship of the population demographics race, age and gender and providers' influence on APM patient behavior. I explored the preventative quality performance measure for colon cancer screening ACO #19 for the Medicare Shared Savings Plan (MSSP) ACO guidelines.

Significance of the Study

ACOs introduced patient engagement initiatives to lower the U.S. healthcare costs with different levels of success (Noble et al., 2014). Some ACO populations include underserved and vulnerable patients who are covered by both Medicare and Medicaid (Powers & Keohane, 2018). Abundant data on health care quality are captured by CMS performance reports (CMS, n.d.). The literature, however, has not shown evidence as to why providers were successful at influencing patient behavior. Disparities for preventiative care and health outcomes exist for people with different insurance types

(Kiviniemi et al., 2018). Davis et al. (2017), demonstrated that lower socioeconomic patients and Medicaid patients experienced bias when they pursued CRC screening. However, provider perceptions and their experience of engaging patients attributed to their APMs have not been explored in detail (Hibbard et al., 2015). One application of this rationale was shown in a study of an emerging United Kingdom healthcare model in which providers were paid incentives to develop patient focus groups with the intention of a community-based participatory approach to improve provider care delivery (Smiddy et al., 2014). Smiddy et al., (2015) proved that financial incentives increased the number of focus groups but found little impact on the quality of care delivered. Smiddy's model (2015) applies to my study as exploring provider experiences managing patient populations with Medicaid or lower socio-economic status might explain to what degree they effect patient behavior compared to the measures that determine their payments. My study found that ACOs with higher numbers of Medicaid patients had lower CRC screening rates.

Relevant Contribution to the Body of Knowledge

This manuscript is the first of three manuscripts to a cross-sectional quantitative study to explore the preventative quality performance for colon cancer screening under MSSP ACO guidelines. My broader study explores how patient demographic characteristics race, age, gender, and insurance coverage predict performance. This manuscript fills a gap in research by focusing on provider practice characteristics. My cross-sectional study provides a more comprehensive assessment of physician influence on patient behavior than studies like those from CMS. The purpose of my study was to

assess the relationship between patients' insurance coverage and provider effectiveness at influencing patient behavior as measured by the compliance of MSSP performance measure ACO #19.

Framework

The socioecological model (SEM) guides my cross-sectional quantitative study. I assessed data from the MSSP public use file (PUF). Under the SEM, provider performance is affected by factors that influence both their decision making and their effectiveness to change patient behavior (Rabarison et al., 2013). SEM posits five categorical levels which affect behavior change (Lampard et al., 2013). These levels include the individual, interpersonal, organizational, community/environment, and society/policy levels (Lampard et al., 2013). While the factors of the SEM are hierarchical, they are also integrated, and a change in one area could impact others (Coreil, 2009).

The positivist ontology also guides my study. Positivism implies that there is a single truth (Burkholder et al., 2016). Medicare reports ACO #19 measure attainment through a PUF. Thus, these results reflect a single truth of their performance. My study assessed how insurance coverage predicts how effective providers are at achieving ACO #19 measure attainment. My findings are the source of truth under the positivist ontology for my study

My study is influenced by multiple contexts. The personal contexts for my study include my knowledge and experience with advance payment models and patient engagement. The social contexts include CMS guidelines, the fluidity of US healthcare

policy, political climate, geographic locations, and local healthcare delivery priorities. Lastly, interpersonal contexts include Walden University dissertation committee representatives.

The definition of "provider success" is precise and supports a quantitative ontology of positivism where there is one true reality (Burkholder et al., 2016). Positivism guided my cross-sectional quantitative study to answer the question; "How effective were providers at influencing patient behavior based on the performance measure ACO #19 of the Medicaid Shared Savings Plan?". I analyzed archival data from the CMS to support the positivist approach to my research question (Burkholder et al., 2016).

Background

Colorectal cancer (CRC) is a leading cause of death in the United States (Lloyd, 2016). The Centers for Disease Control and Prevention estimated over 40,000 deaths attributed to colon cancer in 2016 (Bachman et al., 2018). The risk of CRC mortality can be reduced with early detection (Lloyd, 2016). Focused efforts to increase CRC screening led to a reduction of CRC related deaths in the last decade; yet, several disparities continue to exist across socioeconomic and racial/ethnic boundaries (Bromley et al., 2015). Klabunde et al. (2015) reported that almost 25% of adults between 76 and 84 did not meet the U.S. Preventative Services Task Force recommendations for CRC screening before the advent of Medicare ACOs.

APMs were created to fight rising health care costs in the United States (Noble et al., 2014). ACOs are one of the advanced payment models designed to shift the focus of

healthcare services from a traditional fee for service structure to a value-based care model. CRC screening is a key focus and measurement of ACOs. The propensity for provider recommendations for appropriate screening based on the Preventative Services Task Force recommendations for CRC screening was very low before the advent of Medicare ACOs (Klabunde et al., 2015). Studies showed that socioeconomic status was a patient characteristic and determinant of CRC screening completion (Farrukh & Mayberry, 2019).

Some ACO populations include underserved and vulnerable patients who are covered by Medicaid in addition to their Medicare coverage (Powers & Keohane, 2018). Researchers found that Medicaid patients experienced bias when they pursued CRC screening (Davis et al., 2017). For example, Nymo, Aabakken, and Lassen (2018) reported that Medicaid patients experienced longer wait times when they scheduled CRC screening procedures whereas more affluent patients were prioritized to enhance their patient experience and satisfaction. Thus, providers must be aware of both intentional and unintended bias when working with patients from different cultures and socioeconomic groups (Alspach, 2018). Other studies, however, suggested Medicaid patients received more opportunities for CRC screening as care coordination improved for dual eligible patients (Craver et al., 2018). In fact, Davis and colleagues (2019) found evidence that CRC screening increased for Oregon Medicaid patients who were enrolled in an ACO. However, their research observed an ACO structure designed exclusively for Medicaid patients (Davis et al., 2019). Evidence also showed that more ACOs were more likely to have formal partnerships with public health agencies where there were large numbers of

Medicaid patients and where residents were eligible for both Medicare and Medicaid (Costich, Scutchfield, & Ingram, 2015)

Research further documented disproportionate racial and socioeconomic disparities and highlighted the diverse cultural requirements needed to influence patient behavior (Ashktorab et al., 2017; Bromley et al., 2015; Burnett-Hartman et al., 2016; Chablani et al., 2017). Many studies offered anecdotal patient interventions for patients not enrolled in APMs (Nathan et al., 2016; Singal et al., 2017; Slyne et al., 2017). Additionally, studies that focused on non-APM patient experiences reinforced culturally competent approaches based on diverse patient demographics (Alsayid et al., 2019; Brittain & Murphy, 2015; Chen et al., 2016).

Fear was demonstrated to be a major influence for compliance by all patients, but particularly among blacks and Hispanics (Basch et al., 2016; Bromley et al., 2015; Hall et al., 2016; Kiviniemi et al., 2018; Mastrokostas et al., 2018). Fear emerged as fear of both fear of undergoing the procedure and fear of the procedure's findings (Bromley et al., 2015). Ineffective communication and perceived provider uncertainty also affected the patient decision-making process (Beverly et al., 2016). This was confounded by patients' expectations of the provider (Alspach, 2018; Mast & Kadji, 2018). For example, patients with different socio-economic backgrounds had different expectations of the quality of care they should receive from providers (Mast & Kadji, 2018). As such, trust was demonstrated to be a contributing factor behind non-compliance of CRC screening for Hispanic patients and patients of lower socio-economic status (Hong et al., 2018). Studies

also showed unconscious bias by providers when treating patients of different demographics and socioeconomic status (Williams et al., 2015).

Medicare recognizes four methods of colonoscopy screening to demonstrate compliance with the ACO #19 measure (Prince et al., 2017). These include colonoscopy, DNA, stool testing, and fecal occult blood test. Studies suggest CRC compliance varies with the type of test offered, Thus, could impact the CRC screening recommendations that providers make to their patients (Alsayid et al., 2019; Basch et al., 2016; Bian et al., 2016; Brenner & Chen, 2017; Bromley et al., 2015; Chambers et al., 2016).

Colonoscopy is the most popular forms of CRC screening, and includes multiple steps like scheduling, bowel preparation, sedation, and the procedure itself; some of which contain multiple levels of compliance (Powers et al., 2018). For example, strategies such as enhanced written education, media campaigns, and videos improve compliance with the bowel preparation step (Andrealli et al., 2018; Cole et al., 2019; Essink-Bot et al., 2016). However, they were demonstrated as less effective to improve patient health literacy and compliance for completing a colonoscopy procedure (Clark et al., 2017; Enard et al., 2015; Mishra et al., 2018).

Success varied among the experimental APMs in the United States (Noble et al., 2014). Hibbard et al. (2015) documented that compensation from APMs in other countries influenced physician opinions on the importance of patient behavior. They further provided evidence that patient behavior was the primary driver of improving quality (Hibbard et al., 2015). Other studies showed that improvements in patient engagement lead to better health outcomes (Simmons et al., 2014; Grand et al., 2014).

Physicians in the United States agreed that patient behavior was the key determinant to improve quality and outcomes, yet, many found frustration when they tried to influence individual behavior (Hibbard et al., 2015). While many providers perceived their role within the community and in population health as “medicine-based”; a growing emphasis on preventative care and the diverse characteristics of their attributed patient base fostered better collaboration between healthcare providers and traditional public health organizations (Ingram et al., 2015). This was particularly true for mutual objectives like cancer prevention or serving a large number of Medicaid patients (Basch et al., 2016; Ingram et al., 2015).

Nywelde et al. (2015) showed the initial performance under the Medicare ACO model reduced healthcare expenditures within the attributed population base when compared to traditional Medicare fee-for-service beneficiaries. The CMS measures ACO providers across four domains, which include care coordination, patient safety, patient experience, and preventative health (Modi et al., 2018). Providers are rewarded for the decreased cost of patient care as well as achieving various quality metrics outlined in their ACO contracts.

Studies documented provider perceptions of barriers and provider characteristics that influenced their decision making and level success (Mastrokostas et al., 2018; Wang et al., 2018). These included the basic ability to verify patient’s correct CRC status and the clinician’s ability to confer with specialists (Mastrokostas et al., 2018) For example, a provider recommendation is a primary influence on whether patients of all demographic groups participate in CRC screenings (Bian et al., 2016; Bromley et al., 2015). Some

studies showed that health information technologies that shared patient information, insurance information and alerted providers to the patient's CRC risk or screening status nudged providers to provide CRC screening recommendations (Kim et al., 2017b; Mankaney et al., 2019). Additionally, other studies reiterated the importance of Patient Behavior on quality performance and the need to implement systems to support patient engagement activities to influence behavior (Mishra et al., 2018). These included the concepts of, motivational interviewing, goal setting, and shared decision making (Mishra et al., 2018). However, Mishra et al. (2018) reported that providers were aware of these concepts but often lacked the depth of understanding and practice to implement them in a meaningful way. Shapiro et al. (2018) further described provider experiences with tough to manage patients in which providers described themselves as anxious, frustrated, and uncertain with little preparation for how to handle difficult patients. My study fills a gap in research by focusing on the patient insurance coverage to achieve compliance with CRC screening recommendations.

Research Question and Design

The nature of the manuscript is a cross-sectional quantitative study for the following research question:

Based on the performance measures of the MSSP, what is the relationship between insurance and compliance of MSSP performance measure ACO #19?

H_0: There are no statistically significant differences in behavior as measured by the compliance of MSSP performance measure ACO #19 based on insurance coverage.

H_a: There are statistically significant differences in behavior as measured by the compliance of MSSP performance measure ACO #19 based on insurance coverage.

The rationale for these research questions are based on a series of assumptions. First, there are outcomes related to patient behavior that are reported by CMS. Second, there are outcomes related to patient behavior that are perceived by physicians (Ravitch et al., 2016). Third, success can be measured through CMS reporting (CMS, 2017).

Cross-sectional quantitative studies are descriptive research to describe community characteristics at a single point in time. I analyzed data from the MSSP PUF from 2019. I assessed the relationship of dependent variable ACO performance for measure ACO #19 and the independent variable patient insurance.

Methods

Operational Definitions

ACO #19: Percentage of adults between 50–75 years of age who had appropriate screening for CRC for ACO quality reporting (CMS, 2017).

Alternative payment delivery models: Several experimental advance/APMs have been created with varying success to introduce new patient engagement initiatives to combat higher U.S. healthcare costs (Noble et al., 2014).

Attribution: The patients assigned to the health care provider for which they are being measured (Noble et al., 2014).

Patient engagement: Studies show that improvements in patient engagement lead to better health outcomes (Simmons et al., 2014).

Practice size: The number of patients and the number of primary care physicians in an ACO.

Bias and Limitations

I analyzed archived data from the CMS; therefore, the quality of this quantitative data source was beyond my control as the researcher and contingent on the data collection process for MSSP reporting (Burkholder et al., 2016). CMS (2017) allows providers to review and dispute published performance data, followed by a final CMS ruling. I used the final report issued by CMS which included corrections to improve data quality. I coalso uld not control confounding variables that may influence provider-patient attribution (Noble et al., 2014). These included patient comorbidities that can affect patients abilities to comply with healthcare treatment plans (DeJean et al., 2013).

Scope and Delimitations

The MSSP ACO PUF details physician performance against 32 measures across four domains (CMS, n.d.). The results are the official CMS findings and used to pay provider incentives (Noble et al., 2014). Therefore, these measures are valid representations of physician performance. The scope of my study was to evaluate physicians' performance against the CMS measurement for colon cancer screening "ACO #19".

I limited my target population to the subset of organizations that had previous experience with MSSP ACOs and those who reported data for the 2019 MSSP reporting year. Excluding first-year MSSP participants improved credibility by ensuring that providers in the sample had a baseline measurement that reflected their performance

better (Noble et al., 2016). Foo et al. (2017) showed disparities in provider-patient interactions may be influenced by the factors race and patient insurance coverage. Therefore, a third delimitation limited the participatn sample to those with a patient base with at least 10% non-White and accept both Medicaid and Medicare patients (CMS, 2017). Succesful attainmnet of ACO #19 was detrmined by a score of at least 30% (CMS, 2017). I differentiated well-performing providers from poor performing using this recognized benchmark as a fourth delimitation (CMS, 2017).

Design

Positivism guided the cross-sectional quantitative study to answer the question, "How effective are providers at influencing patient behavior based on the performance measure ACO #19 of the Medicaid Shared Savings Plan?" Archival data analysis from the CMS 2019 MSSP PUF supported the positivist approach to my research question. I used the quality performance data for healthcare providers reported in the PUF to determine their effectiveness at influencing patient behavior as it correlated to their practice size.

Instrumentation

Archival data from the MSSP PUF for 2019 was used for the data collection process. The MSSP ACO PUF was derived from a combination of provider claims and survey data. The PUF files are available for performance years 2013-2019. The PUF file included hundreds of variables, descriptions and performance measure outcomes. These included measures for six behavior related preventative measures. Performance measures

were captured as a percent of the total population where a higher score means higher performance for that measure.

Provider incentives for MSSP ACOs were based on quantitative analysis of their performance against established benchmarks (Noble et al., 2014). As such the current reporting for the effectiveness of APMs is dichotomous as the providers did or did not meet their measurement objectives (CMS, n.d.). This clear determination of provider success supports a quantitative ontology of positivism in which there is one true reality (Burkholder et al., 2016). Furthermore, quantitative analysis of provider performance using MSSP public use data is an accepted practice among the healthcare community (Noble et al., 2016).

Participants

I limited the evaluation of provider performance to organizations in the United States who had previous ACO experience prior to 2019 and who reported data for the 2019 MSSP reporting year. Previous studies showed that providers treated patients differently according to sociodemographic characteristics (Foo et al., 2017; Manteuffel et al., 2014). Therefore, I restricted participants to ACOs with a patient base of at least 10% non-White and who accepted both Medicaid and Medicare patients. Furthermore, CMS set a minimum standard of 30% achievement to comply with MSSP guidelines. Therefore, participant selection was based on provider performance compared to the 30% benchmark.

Data Sources

Archival data was reviewed from the MSSP PUF for 2019. I used data for new and returning ACO participants from the 2019 MSSP PUF. I described the extent that ACOs were successful with measure ACO #19. I uploaded the entire MSSP PUF database into SPSS v25 for review, analysis, and statistical testing.

Quantitative Collection and Analysis

I assessed how effective ACOs were at changing patient behavior. I described the extent that ACOs were successful at achieving colon cancer screening for measure ACO #19. I uploaded the entire 2019 MSSP PUF database into SPSS v25 for review, analysis, and statistical testing. I retained the native MSSP PUF document, which was uploaded multiple times with all statistical tests replicated to ensure integrity and reliability. I used Pearson Correlation and linear regression to determine if there was a significant relationship between ACO practice size and performance. The level of significance was set to 0.05.

Results

Based on the performance measures of the MSSP, what is the relationship between insurance coverage and compliance with MSSP performance measure ACO #19?

H_0: There are no statistically significant differences in compliance with MSSP performance measure ACO #19 based on insurance coverage.

H_a: There are statistically significant differences in compliance with MSSP performance measure ACO #19 based on insurance coverage.

Execution

Archival data from the MSSP PUF (CMS, n.d.) for 2019 were assessed for 470 ACOs. I calculated an additional variable to reflect the percentage of the total population by race, age, gender, and Medicaid status in Microsoft Excel. The modified file was then entered into SPSS version 25 to organize, code, and screen data. Data for ACO #19 score and practice size were recoded to ordinal categorical data. Values were calculated including frequency counts and percentages with SPSS. Descriptive data analysis was performed for frequencies for all ACOs.

The final sample size was narrowed to 140 ACOs based on the inclusion and exclusion criteria for the study. These included previous experience in the MSSP program and an ACO #19 score of 30 or more, an attribution that was at least 10% non-White. I performed statistical assumption tests for normal distribution, homoscedasticity, and linearity between dependent and independent variables before research question analysis. Table 14 summarizes the dependent, independent variables, and statistical analyses used to evaluate the research questions.

Table 14

Variables and Statistical Tests Used to Evaluate Research Questions

Research Question	Dependent Variable	Independent Variable	Analysis
What is the relationship between insurance and compliance with MSSP performance measure ACO #19?	ACO #19 Score	Number of Medicaid Patients Percent of Medicaid Patients	Pearson Correlation Linear Regression

Note. ACO = accountable care organization

Descriptive Statistics for all ACOs

Descriptive analysis for all (n = 470) ACOs and the target sample (n = 140) were conducted for ACO #19 performance and insurance. Table 15 shows the ACO #19 performance with most organizations achieving between 50% and 90%. Performance for the target population aligned with the larger base with most organizations (n = 85) achieving between 70–89% followed by those between 50–69% (n = 47).

Table 15

ACO #19 Performance Range and Frequency

	All ACOs		Target ACOs	
ACO #19 Score	Frequency	Percent	Frequency	Percent
0-29	4	0.9		
30-49	13	2.8	4	2.9
50-69	157	33.4	47	33.6
70-89	287	61.1	85	60.7
90 to 100	9	1.9	4	2.9
Total	470	100.0	140	100.0

Note. ACO = accountable care organization

Most ACOs had less than 200 primary care providers with the majority falling between 50–99 at roughly 22%. ACOs that did not report a score for ACO #19 (n = 4) were removed. Of the remaining (n = 466) there was a total of 9,918,470 patients. Table 16 shows beneficiaries with Medicaid totaled 606,989 or six percent of total patients. The number of patients with Medicaid ranged from 67-17,981.

Table 16

Range and Percentage of Attribution Across all ACOs

	Minimum	Maximum	Sum	Percent
Total Patients	2,193	239,924	9,918,470	
Medicaid Patients	67	17,981	606,989	6%
Non-Medicaid Patients	1,346	181,135	7,917,736	80%

The attribution of most ACOs in the target population was under 40,000 patients. Table 17 shows that over half of the ACOs carried an attribution of between 10,000 and 39,999 followed by a range of 2,193 to 9,999 (27%).

Table 17

Range and Percentage of Attribution

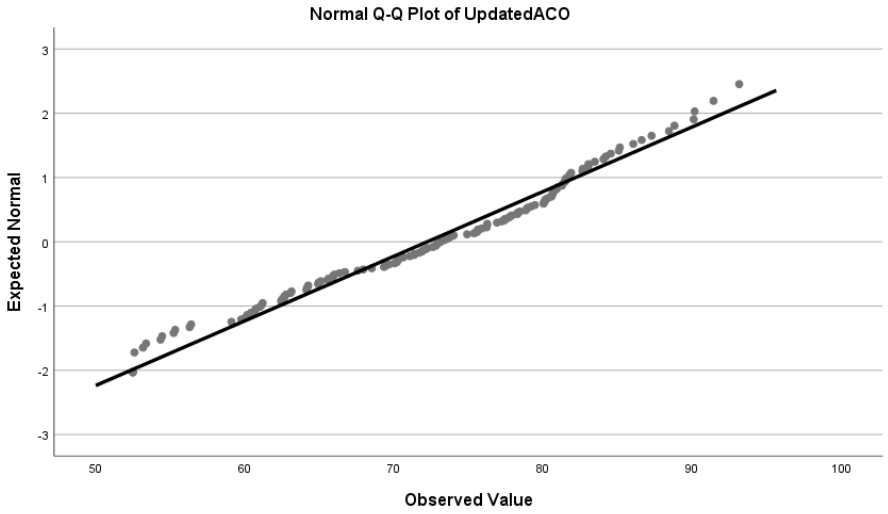
Attribution Range	Frequency	Percent
0-9,999	38	27.1
10,000-39,999	77	55.0
40,000-79,999	19	13.6
80,000 or more	6	4.3
Total	140	100.0

Tests of Assumptions

I conducted assumption tests of the dependent variable ACO #19. The data were normally distributed and follow a normal distribution curve. The skewness and kurtosis tests for normal distribution should fall between the rage of ±2 and ±7 respectfully. The ACO #19 score data for skewness was -.287 and kurtosis was -.692. The Kolmogorov-Smirnov test for normality was insignificant at .058. Figure 5 shows the normal Q-Q plot of the data.

Figure 4

Normal Q-Q Plot for ACO #19 Performance



Note. ACO = accountable care organization

Inferential Statistics

The Medicaid.gov website (2021) defines Medicaid as insurance coverage provided by states according to federal requirements for eligible low-income patients and people with disabilities. I found that insurance coverage of patients in an ACO statically influenced ACO #19 performance. Therefore, the null hypothesis that there was no relationship between insurance and ACO #19 performance was rejected. I used bivariate correlation to assess the relationship between the dependent variable ACO #19 Performance and independent variables for insurance (Medicaid). These included the total of Medicaid patients and the percentage of Medicaid patients of the total population. Table 18 shows the number of non-Medicaid patients in an ACO had a positive correlation of .247 that was statistically significant with $p = .003$. The percentage of

patients in the ACO had negative correlation of -.357 that was statistically significant with $p<0.05$.

Table 18

Correlation Between Medicaid and ACO #19 Performance

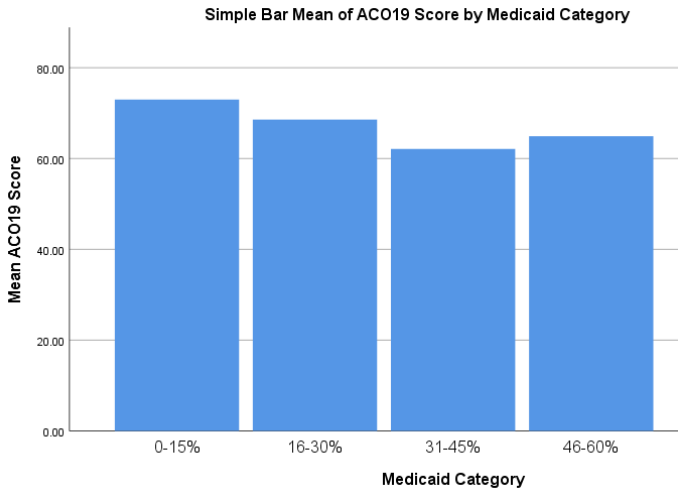
			Medicaid Patients	Non-Medicaid Patients	Medicaid Percent
ACO #19 Performance	Pearson Correlation	1	-0.096	.247**	-.357**
	P value		0.259	0.003	0.000
	N	140	140	140	140

Note. ACO = accountable care organization. **. Correlation is significant at the 0.01 level (2-tailed).

Medicaid only accounted for six percent of the total (n = 466) of the total population. However, figure six shows ACOs in the target sample (n = 140) with higher percentages of Medicaid patients performed lower than those with less.

Figure 5

ACO #19 Score and percent of Medicaid



Note. ACO = accountable care organization

Linear Regression

I used linear regression to further analyze the correlations between ACO #19 Performance and levels of insurance coverage within the ACO population. The relationship was statistically significant *(F*(3,136) = 8.12, *p*<.05). Insurance accounted for a 15.2% variance in ACO performance and an adjusted R^2 of .133. ACO performance decreased *B* = -.001 as the number of Medicaid Patients in increased. Performance decreased by *B* = -.228 as the percent of Medicaid patients in the ACO increased.

Discussion

Interpretation

My research correlates with previous research around physician influence on paitent behavior and patient compliance with physicina recommendations. For example, Klabunde et al. (2015) reported that almost 25% of adults between 76 and 84 did not meet the U.S. Preventative Services Task Force recommendations for CRC screening before the advent of Medicare ACOs. My findings showed that only four out of 470 ACOs did not meet the minimum performance score of 30 for ACO #19. However, 36% of the 140 target ACOs scored under 70%.

The first ACOs showed an increase in CRC screening for patients 65 years or older when compared to non-ACO patients or the start of the ACO model (Preston et al., 2018); however, significant disparities for screening rates were found between White and Black or Hispanic ACO members (Bromley et al., 2015). Additionally, the trend to improve quality measures has not applied to ACOs in underserved communities nor among racial disparities (Bromley et al., 2015). My overarching study found that ACOs

with more Black and Hispanic patients did not perform as well for ACO #19. Other researchers have also found disparities in compliance among people with health behavior recommendations based on factors including insurance coverage (Kiviniemi et al., 2018; Manteuffel et al., 2014).

Additionally, I found that higher numbers and percentages of Medicaid patients negatively affected ACO #19 performance. Medicaid is insurance coverage for eligible low-income patients. Thus, high number of Medicaid patients could indicate lower socioeconomic status of the ACO attribution. But caution should be made when generalizing these results as they were not calculated at the individual patient or provider level.

Interpretation in the Context of the Socioecological Model

My study was guided by the SEM. Under the SEM, provider performance is affected by factors that influence both their decision making and their effectiveness to change patient behavior (Rabarison et al., 2013). My study showed that participation in an ACO and practice size as total patients and number of minorities may influence provider effectiveness to change patient behavior. Furthermore, results demonstrated that factors related to the characteristics of their patients influences their effectiveness. Society/policy factors tied to creating ACOs and their CMS quality measurements (i.e., success defined by a score of at least 30 for ACO #19) are also influential. My study did not report findings related to race. However, my overarching research demonstrated that high percentage of minorities negatively influenced provider effectiveness.

Limitations

There are limitations to my study. First, I excluded new ACOs from the full analysis. Thus, the range of performance of the sample population (n = 140) may not reflect the distribution of the entire ACO base (n = 470). Nor may it reflect provider patient relationships for providers and patients that do not participate in ACOs. Caution should be used when generalizing these results for other applications. Second, the MSSP PUF file data are restricted to the variables within the data set. The file does not provide CRC screening results at the individual level for patients or providers. Thus, my findings are limited to generalizations about ACOs based on total number of providers, total number of patients, and percentages of patients with certain characteristics. As a result, I am unable to articulate differences in ACO #19 compliance at the individual patient and rely instead solely on the ACO #19 performance score. I am also unable to articulate difference at the individual provider level. Lastly, the MSSP PUF has a one-year delay in reporting. The results were provided before the significant change in care delivery due to the COVID-19 pandemic and may influence the generalizability for future applications.

Implications

My study supported previous research that showed the characteristics of the providers' patient population affected their ability to influence patient behavior. It further demonstrated disparities among poor patient populations. It also supports evidence which suggested that lower socioeconomic patients and Medicaid patients experienced bias when they pursued CRC screening (Davis et al., 2017). This may call for a focus on cultural competency strategies to mediate intentional and unintended bias when working

with patients from lower socioeconomic groups (Alspach, 2018). ACOs are partnerships among care providers including public health organizations. Thus, ACOs should consider their care delivery strategies and policies for lower socioeconomic populations as to the eligibility for enrollment and the scope of benefits they receive.

My study promotes positive social change by providing meaningful data to the public health and health care provider partnerships engaged in transforming healthcare from a transactional delivery system to an evidence-based system of value (Berenson et al., 2016). My study helps to decrease the prevalence of CRC and by doing so reduce the economic and quality of life burden for individuals suffering from the disease. Moreover, my study may help to reduce disparities for CRC screening and incidence of CRC among poor populations. It provides a foundation for population health initiatives beyond CRC related illness Thus, improving the wellbeing of communities and increase public health emergency preparedness. Thus, my study can improve public health and healthcare professionals' ability to influence the behaviors and health outcomes of the community members they serve. This is a vital component of current efforts to screen for COVID-19, promote adoption of behaviors to slow the spread of COVID-19 and adoption of COVID-19 vaccinations.

The CMS (2012) stated that more than 70% of patients over the age of 65 have two or more chronic conditions. The management of patients with multiple chronic diseases is more difficult than in those suffering from a single condition (Wagner et al., 2013). Wang et al., observed (2020) that elderly COVID-19 patients were among the

most severe to critical cases with a high rate of fatality. Thus, the results of my study apply to current efforts for high risk elderly patients, their providers, and communities.

Cancer screening rates have declined due to the COVID-19 pandemic (Carethers et al., 2020). The COVID-19 pandemic disproportionality affected poor and minority communities (Carethers et al.). As such, Carethers et al., posit that extended delays in cancer screening is expected to lead to increase cancer for all populations. This is expected to be elevated in minorities and lower socio-economic people. My findings offer insight as to which populations may be at greater risk based on their previous experience with CRC screening before the pandemic.

Lastly, my study may offer guidance to public health and healthcare provider leaders on ways to train professionals better, reduce frustration, improve success and achieve higher levels of satisfaction in their work both in routine interventions and public health emergencies.

Recommendations

Several recommendations resulted for additional research from my study. Additional analysis should be conducted for further assessment of ACO #19 performance based on additional patient characteristics such as age, race and gender. Second, CRC screening is the most complex behavior measured for ACOs which include a variety of tests with multiple steps like colonoscopy screening. This contrasts with dichotomous behaviors like receiving a flu-vaccinations. I recommend future studies compare complex behaviors like CRC with dichotomous decision like influenza vaccination.

The study should also be replicated for all 470 ACO participants. This may provide insight on differences and similarities to new and experienced ACOs. The study should also include provider feedback using the Primary Care Provider Behavioral Health Intervention Survey. The original tool was designed to assess provider perceptions of factors that influence their intention to use interventions when treating children with mental health problems and can be modified for adults (Arora et al., 2016).

Lastly the study should be replicated and expanded as a mixed methods explanatory sequential study. Mixed methods integrates open-ended qualitative data with closed-ended quantitative data from inquiry (Creswell, 2009). Mixed methods strategy is purpose-driven research to provide a more in-depth insight into how health professionals influence participant behavior (Creswell, 2009). Mixed methods can develop a more comprehensive understanding of changes needed for population engagement as well as understanding the process and outcomes of current patient engagement strategies (Creswell, 2009).

Conclusion

Health care delivery and public health have overlapping efforts like health screening activities for better health outcomes and to lower the burden of disease (Cunningham, et al., 2020). Partnerships between community-based organizations, health care delivery and public health organizations improve public health outcomes. Studies showed patient behavior was the key to improve quality and health outcomes (Mogre et al., 2019).

The MSSP ACO is partnership based advanced payment model designed to curb cost and improve patient outcomes for colon cancer among other disease measures. CRC is a leading cause of death in the United States, (Loyd, 2016) and more research is needed to determine the impact of MSSP ACO providers on CRC screening.

Previous research found disparities in health behavior recommendation compliance among people based on insurance and socio-economic status. My quantitative study of 140 ACO participants sought to determine the relationship between Medicaid coverage and compliance with MSSP performance measure for colonoscopy screening ACO #19.

My study supported previous research that showed the characteristics of the providers' patient population affected their ability to influence patient behavior. It further demonstrated disparities among minority and poor patient populations. My study showed differences in performance based on the number and percentage of patients with Medicaid. Performance decreased as the number and percentage of patients increased. This aligned with previous research which showed ACOs in underserved or lower socio-economic areas did not perform as well as their peers in other areas.

My study addressed the gap in research and focused on the distribution of Medicaid patients in ACO patient populations. It contributes to positive social change by providing meaningful data to public health partnerships and policies that impact community health outcomes for lower socio-economic patients. Therefore, the application of my findings can improve the ability of public health and healthcare

providers to predict their influence on behavior and health outcomes of the community members they serve.

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Part 3: Summary

Integration of the Studies

My three studies incorporated different social determinants of health as independent variables toward the same dependent variable—ACO success for CRC screening. Collectively, these studies provide a picture of how ACO structures and the characteristics of their attribution contribute to patient behavior. For instance, previous researchers have found disparities in compliance among people with health behavior recommendations based on age, race, gender, insurance coverage and the size of their providers' practices (Kiviniemi et al., 2018; Manteuffel et al., 2014). My results also found disparities based on age, race, insurance coverage, and practice size as defined by the number of patients. Additionally, the results showed that the number of providers may not affect provider influence due to the collaborative nature of ACOs. Gender did not influence performance in my study. However, the nature of my data was beyond individual patients and warrants further exploration at the individual level. One observation was that the number of patients in an ACO had a positive correlation to ACO #19 performance. A quantitative follow up with primary care physicians may provide more rationale for this phenomenon.

Broadly, the factors of my studies relate to the community and organizational levels of the SEM. This is in part because the MSSP public use file provided attribution level data rather than individual patient data. The policy level is nested in the rules and guidelines of ACO formation, participation in the MSSP ACO program, and other factors. As such, I recommend that future studies explore behavior and decision making

at the individual level for patients and providers. This may provide more depth of understanding of the provider and patient relationship. Furthermore, exploring the specific strategies to influence behavior can also provide meaningful data for anyone engaged in influencing behaviors related to public health. Provider experiences to engage community members in their ACO attribution with varying social determinants of health has not been fully explored. Thus, there is an inability to replicate best practices for population engagement, which could improve health outcomes, participant experiences, lower costs, and improve job satisfaction.

The social change contributions for my studies may offer meaningful data to public health organization and health care provider partnerships. They may help decrease the prevalence of CRC and by doing so reduce the economic and quality of life burden for individuals suffering from the disease. Moreover, my studies may help to reduce disparities for CRC screening, incidence of CRC, and other poor health outcomes among vulnerable populations, thus improving the well-being of communities and increasing public health emergency preparedness. My studies may also offer guidance to both public health and healthcare provider leaders on ways to train professionals better, reduce frustration, improve success, and achieve higher levels of satisfaction in their work both in routine interventions and public health emergencies.

Conclusion

Health care delivery and public health have overlapping efforts like health screening activities for better health outcomes and lowering the burden of disease (Cunningham et al., 2020). Partnerships between community-based organizations, health

care delivery, and public health organizations improve public health outcomes. The MSSP ACO is a partnership-based advanced payment model designed to curb cost and improve patient outcomes for colon cancer among other disease measures. However, more research is needed to determine the impact of MSSP ACO providers on CRC screening. Additionally, studies have also shown that patient behavior is the key to improve quality and health outcomes (Mogre et al., 2019).

My quantitative study of 140 ACO participants sought to determine the relationship between patient attribution and provider characteristics with performance measure for colonoscopy screening ACO #19 compliance. My findings correlate with previous research. My results showed that the number of primary care physicians in an ACO did not influence their ACO #19 score. Thus, primary care provider participation and collaboratoin in an ACO may mediate some of the contraints found in other studies on practice size and ACO performance. I found that ACOs with more patients performed better. However, performance declined as the number and percentage of non-White patients increased. This aligned with previous research that showed disparities across socioeconomic and racial/ethnic groups. I found further differences in performance based on age. Performance increased for ACOs with more patients between the age of 65-85 years old and declined with higher numbers of patients below 65 years old and over 85.

My study also found that performance decreased as the number and percentage of Medicaid patients increased. This aligned with previous research that showed ACOs in underserved or lower socioeconomic areas did not perform as well as their peers in other

areas. My results did not show a difference in performance based on the gender of the ACO population.

My study addressed the gap in research and focused on providers' abilities to influence APM participant behavior. The research contributes to positive social change by providing meaningful data to public health partnerships that impact community health outcomes. Thus, the application of my findings can improve the ability of public health and healthcare providers to influence the behaviors and health outcomes of the community members they serve.

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