Quality Performance in Community Pharmacies: An Exploration of Pharmacists' Perceptions and Predictors

by

Benjamin Samuel Teeter

A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
December 12, 2015

Keywords: Pharmacy Star Ratings, Quality Improvement, Leadership, Knowledge of Star Ratings, Attitude toward Performance Measurement and Monitoring

Approved by

Salisa Westrick, Chair, Associate Professor of Health Outcomes Research and Policy
Brent Fox, Associate Professor of Health Outcomes Research and Policy
Kimberly Garza, Assistant Professor of Health Outcomes Research and Policy
Stan Harris, Associate Dean and Torchmark Professor of Management
David Nau, President of Pharmacy Quality Solutions

Abstract

The improvement of healthcare quality has become an increasingly important issue in recent years. In an effort to improve quality of care, the Centers for Medicare and Medicaid Services has created a star rating system that rates insurance plans based on performance metrics. As plans attempt to improve their ratings, they have begun leaning on pharmacies to improve their performance on 5 medication utilization measures. It would be helpful to know factors associated with performance in pharmacies so that effective strategies can be designed to address these factors.

This dissertation explored the effect of leaders' awareness, knowledge, attitude toward performance measures, offering of quality improvement-related initiatives, use of a pharmacy performance monitoring system, and leadership style on global pharmacy performance on the star rating measures.

An exploratory, mixed-methods design was utilized. Data collection and analysis was conducted in 2 major phases. In phase I, qualitative interviews with pharmacy owners of independently-owned pharmacies were conducted. Questions covered general services offered in pharmacies and awareness of the star rating measures that can be directly impacted by the pharmacist. Phase II utilized a cross-sectional study design. Data was collected from two sources: 1) a self-administered questionnaire to gather pharmacists' knowledge, awareness and attitudes as well as offered quality improvement-related initiatives and organizational leadership and 2) pharmacy performance data from Pharmacy Quality Solutions and CECity.

Analysis of Phase I interview data led to the identification of 4 themes: 1) Awareness, 2) Attitudes, 3) Relationships, and 4) Technology. Pharmacy owners were aware of the star ratings but knowledge of measures was lacking. Those that had knowledge of star ratings reported monitoring their performance. Owners seemed to be positive about the star ratings but were skeptical that they would see any benefit from improvement in their performance. They overwhelmingly associated their high performance with their relationships with their patients and employees and they felt technology allowed for more time to spend with patients.

Analysis of Phase II questionnaire and performance data identified statistically significant relationships between knowledge of the pharmacy performance measures and the offering of quality improvement-related initiatives. It also identified attitude towards the star ratings increased the likelihood of the use of the EQuIPP platform while attitude towards the pharmacist's role in improving the pharmacy performance scores decreased the likelihood of the use of the EQuIPP platform. This study was the first known study to investigate factors associated with pharmacy performance on the CMS adopted star rating measures. Further research is needed to identify factors that are associated with pharmacy performance.

Acknowledgements

First and foremost, I want to thank my dissertation chair, Dr. Salisa Westrick, for helping me complete this dissertation. I do not know how I could have accomplished this feat without her guidance. During my graduate education I faced many challenges and Salisa was instrumental in helping me to overcome them. Whether I needed encouragement to finish a paper, funding to buy stamps for my study, or life advice, she was always willing to make time for me and to help resolve the issue. She has helped me develop the knowledge and skills I need to be successful and I am forever grateful for that.

Next, I would like to thank all of my committee members for their constructive feedback and willingness to help me with my dissertation. I want to extend my sincerest thanks to Dr. Brent Fox, Dr. Kimberly Garza, Dr. Stan Harris, and Dr. David Nau, for their support and guidance. Also, thank you to Dr. Lisa Kensler for serving as my University Reader.

I would like to extend a special “thank you for making this dissertation possible” to Dr. David Nau for providing the performance data I needed to test my hypotheses and to Derek Bell, informatics specialist at Pharmacy Quality Solutions, for compiling the data and helping me understand it. Your willingness to collaborate with me was essential to making the study I envisioned a reality.

Next I would like to thank everyone in the Department of Health Outcomes Research and Policy for their support and encouragement. I would not have been able to pursue this degree without the financial support from the Department and having great colleagues to work with

made this a truly great experience. You have all been instrumental in my graduate education and I know we will all keep in touch long after graduation.

I also want to thank all of my friends for still being friends with me even though I probably ignored you at times during this journey. There are too many of you to list but you know who you are! Thank you all for acting interested when I blab on-and-on about my research interests, for saying you can't wait to read my dissertation, and for making me laugh. Dinner and drinks on me if you read this (and I'm betting you won't)!

Finally, I want to thank my family for their love and support. I love you guys so much and I would not have made it this far without you. Mom and Dad, you guys are the best. I am so lucky that I was able to live so close to you and see you on a regular basis the past 6 years. Pack your bags and sell your house, you're moving to Arkansas. Adam, thanks for being my best friend since birth and for all your advice and support over the years. Murray, thanks for the unconditional love. I know you're a dog and can't read but I love you man.

Table of Contents

List of Tables

List of Figures

Chapter 1. Introduction

Healthcare Environment

The improvement of healthcare quality has become an increasingly important issue in recent years. One major reason for the focus on quality improvement is the rise in healthcare costs seen in the United States as of late. Between 1980 and 2010, healthcare spending per person in the United States increased from $1,110 to $8,402 annually (Kaiser Family Foundation, 2012). Additionally, annual health insurance premiums for family coverage between 2002 and 2012 rose from an average of $8,003 to $15,745 (Kaiser Family Foundation, 2012). Many factors contribute to increased healthcare expenditures, some of which include medication non-adherence leading to poor health outcomes and preventable adverse drug events. The avoidable healthcare costs associated with medication non-adherence have been estimated to be between $100 billion and $300 billion annually in the United States (Iuga & McGuire, 2014). Additionally, a June 2013 publication estimated that preventable adverse drug events caused by medication errors and mismanaged polypharmacy in elderly patients accounted for $15.9 billion to $29.7 billion of avoidable healthcare costs annually (IMS Institute for Healthcare Informatics, 2013).

In an effort to improve the United States healthcare system, the Patient Protection and Affordable Care Act was signed into law in 2010. While the bulk of the law focuses on increasing insurance coverage for the uninsured, many sections deal with improving the quality of care provided. Section 10329 of the Act requires the “development of methodology to assess

health plan value that must take into consideration the quality of the care provided under the plan." To address this requirement, the Centers for Medicare and Medicaid Services (CMS) has created a star rating system that rates insurance plans based on a number of performance metrics. These ratings take into consideration both the quality of care provided and the relative risk of plan enrollees compared to other plans. Using these ratings, consumers can compare plans and elect to enroll in the plan that best fits their needs. Additionally, plans with higher ratings (better quality) receive bonus payments while lower performing plans do not. The hope is that this rating system will encourage the improvement of healthcare quality and value while reducing overall costs.

The star rating system is used to measure quality of Medicare Advantage plans with and without prescription drug coverage as well as stand-alone Medicare Part D prescription drug plans. Medicare Advantage plans with prescription drug coverage are given a star rating based on performance on 51 measures. For Medicare Advantage plans without prescription drug coverage and stand-alone Medicare Part D prescription drug plans, the number of measures drops to 36 and 15, respectively. All measures are listed and defined in Table 1.1. The 51 measures are divided into 5 domains: 1) Staying Healthy, Screenings, Tests and Vaccines, 2) Managing Chronic Conditions, 3) Member experience with health plan, 4) Member complaints, problems getting services, and improvement in the health plans performance, and 5) Health plan customer service. For stand-alone Medicare Part D prescription drug plans, the 15 performance measures are divided into 4 domains: 1) Drug plan customer service, 2) Complaints about the drug plan, 3) Member experience with the plan, and 4) Patient safety and accuracy of drug pricing. Because this is a relatively new rating system, the inclusion and removal of

performance measures is ongoing. The calculation and definition of the measures used in 2014 is described in greater detail in the second chapter of this dissertation.

Table 1.1
Medicare Parts C and D Star Rating Measures

Measure	Description	Weight	4-Star Threshold
PART C: Domain 1 - Staying Healthy: Screenings, Tests and Vaccines			
Breast Cancer Screening	Percent of female plan members aged 40-69 who had a mammogram during the past 2 years	1	≥ 74%
Colorectal Cancer Screening	Percent of plan members aged 50-75 who had appropriate screening for colon cancer	1	≥ 58%
Cardiovascular Care – Cholesterol Screening	Percent of plan members with heart disease who have had a test for "bad" (LDL) cholesterol within the past year.	1	≥ 85%
Diabetes Care – Cholesterol Screening	Percent of plan members with diabetes who have had a test for "bad" (LDL) cholesterol within the past year.	1	≥ 85%
Glaucoma Testing	Percent of senior plan members who got a glaucoma eye exam for early detection.	1	≥ 70%
Annual Flu Vaccine	Percent of plan members who got a vaccine (flu shot) prior to flu season.	1	≥ 71%
Improving or Maintaining Physical Health	Percent of all plan members whose physical health was the same or better than expected after two years.	3	≥ 60%
Improving or Maintaining Mental Health	Percent of all plan members whose mental health was the same or better than expected after two years.	3	≥ 85%
Monitoring Physical Activity	Percent of senior plan members who discussed exercise with their doctor and were advised to start, increase or maintain their physical activity during the year.	1	≥ 60%
Adult BMI Assessment	Percent of plan members with an outpatient visit who had their "Body Mass Index" (BMI) calculated from their height and weight and recorded in their medical records.	1	Not predetermined
PART C: Domain 2 – Managing Chronic (Long Term) Conditions			
Care for Older Adults – Medication Review	Percent of plan members whose doctor or clinical pharmacist has reviewed a list of everything they take (prescription and non-prescription drugs, vitamins, herbal remedies, other supplements) at least once a year.	1	Not predetermined
Care for Older Adults – Functional Status Assessment	Percent of plan members whose doctor has done a "functional status assessment" to see how well they are able to do "activities of daily living" (such as dressing, eating, and bathing).	1	Not Predetermined
Care for Older Adults – Pain Screening	Percent of plan members who had a pain screening or pain management plan at least once during the year.	1	Not Predetermined
Osteoporosis Management in Women who had a Fracture	Percent of female plan members who broke a bone and got screening or treatment for osteoporosis within 6 months.	1	≥ 60%

Table 1.1 (continued)

Diabetes Care – Eye Exam	Percent of plan members with diabetes who had an eye exam to check for damage from diabetes during the year.	1	≥ 64%
Diabetes Care – Kidney Disease Monitoring	Percent of plan members with diabetes who had a kidney function test during the year.	1	≥ 85%
Diabetes Care – Blood Sugar Controlled	Percent of plan members with diabetes who had an A-1-C lab test during the year that showed their average blood sugar is under control.	3	≥ 80%
Diabetes Care – Cholesterol Controlled	Percent of plan members with diabetes who had a cholesterol test during the year that showed an acceptable level of "bad" (LDL) cholesterol.	3	≥ 53%
Controlling Blood Pressure	Percent of plan members with high blood pressure who got treatment and were able to maintain a healthy pressure.	3	≥ 63%
Rheumatoid Arthritis Management	Percent of plan members with Rheumatoid Arthritis who got one or more prescription(s) for an anti-rheumatic drug.	1	≥ 78%
Improving Bladder Control	Percent of plan members with a urine leakage problem who discussed the problem with their doctor and got treatment for it within 6 months.	1	≥ 60%
Reducing the Risk of Falling	Percent of plan members with a problem falling, walking or balancing who discussed it with their doctor and got treatment for it during the year.	1	≥ 59%
Plan All-Cause Readmissions	Percent of senior plan members discharged from a hospital stay who were readmitted to a hospital within 30 days, either for the same condition as their recent hospital stay or for a different reason.	3	Not Predetermined
PART C: Domain 3 – Member Experience with Health Plan			
Getting Needed Care	Percent of the best possible score the plan earned on how easy it is for members to get needed care, including care from specialists.	1.5	≥ 85%
Getting Appointments and Care Quickly	Percent of the best possible score the plan earned on how quickly members get appointments and care.	1.5	≥ 75%
Customer Service	Percent of the best possible score the plan earned on how easy it is for members to get information and help from the plan when needed.	1.5	≥ 88%
Rating of Healthcare Quality	Percent of the best possible score the plan earned from members who rated the quality of the healthcare they received.	1.5	≥ 85%
Rating of Health Plan	Percent of the best possible score the plan earned from members who rated the health plan.	1.5	≥ 85%
Care Coordination	Percent of the best possible score the plan earned on how well the plan coordinates members' care. (This includes whether doctors had the records and information they need about members' care and how quickly members got their test results.)	1.5	Not Predetermined

Table 1.1 (continued)

PART C: Domain 4 - Member Complaints, Problems Getting Services, and Improvement in the Health Plan's Performance			
Complaints about the Health Plan	How many complaints Medicare received about the health plan.	1.5	Not Predetermined
Beneficiary Access and Performance Problems	Medicare conducts audits and gives the plan a lower score (from 0 to 100) when it finds problems. The score combines how severe the problems were, how many there were, and how much they affect plan members directly. A higher score is better, as it means Medicare found fewer problems.	1.5	Not Predetermined
Members Choosing to Leave the Plan	The percent of plan members who chose to leave the plan in that year.	1.5	Not predetermined
Health Plan Quality Improvement	This shows how much the health plan's performance has improved or declined from one year to the next year.	3	Not Predetermined
PART C: Domain 5 – Health Plan Customer Service			
Plan Makes Timely Decisions about Appeals	Percent of plan members who got a timely response when they made an appeal request to the health plan about a decision to refuse payment or coverage.	1.5	≥ 85%
Reviewing Appeals Decisions	This measure shows how often an Independent Reviewer thought the health plan's decision to deny an appeal was fair. This includes appeals made by plan members and out-of-network providers.	1.5	≥ 87%
Call Center – Foreign Language Interpreter and TTY Availability	Percent of the time that the TTY services and foreign language interpretation were available when needed by prospective members who called the health plan's prospective enrollee customer service phone number.	1.5	Not Predetermined
PART D: Domain 1 – Drug Plan Customer Service			
Call Center – Foreign Language Interpreter and TTY Availability	Percent of the time that the TTY services and foreign language interpretation were available when needed by prospective members who called the drug plan's prospective enrollee customer service phone number.	1.5	Not Predetermined
Appeals Auto-Forward	Percent of plan members who got a timely response when they made an appeal request to the drug plan about a decision to refuse payment or coverage.	1.5	MA-PD: ≤ 1.3% PDP: ≤ 1.0%
Appeals Upheld	This measure/rating shows how often an Independent Reviewer thought the drug plan's decision to deny an appeal was fair. This includes appeals made by plan members and out-of-network providers.	1.5	MA-PD: ≥ 72% PDP: ≥ 68%
PART D: Domain 2 – Member Complaints, Problems Getting Services, and Improvement in the Drug Plan's Performance			
Complaints about the Drug Plan	How many complaints Medicare received about the drug plan.	1.5	Not Predetermined

Table 1.1 (continued)

Beneficiary Access and Performance Problems	Medicare conducts audits and gives the plan a lower score (from 0 to 100) when it finds problems. The score combines how severe the problems were, how many there were, and how much they affect plan members directly. A higher score is better, as it means Medicare found fewer problems.	1.5	Not Predetermined
Members choosing to Leave the Plan	The percent of plan members who chose to leave the drug plan in that year.	1.5	Not Predetermined
Drug Plan Quality Improvement	This shows how much the drug plan's performance has improved or declined from one year to the next year.	3	Not Predetermined
PART D: Domain 3 – Member Experience with the Drug Plan			
Rating of Drug Plan	Percent of the best possible score the plan earned from members who rated the prescription drug plan.	1.5	MA-PD: ≥ 84% PDP: ≥ 81%
Getting Needed Prescription Drugs	Percent of the best possible score the plan earned on how easy it is for members to get the prescription drugs they need using the plan.	1.5	MA-PD: ≥ 91% PDP: ≥ 89%
PART D: Domain 4 – Patient Safety and Accuracy of Drug Pricing			
MPF Price Accuracy	A score comparing the prices members actually pay for their drugs to the drug prices the plan provided for this Website	1	Not Predetermined
High Risk Medication	The percent of plan members who got prescriptions for certain drugs with a high risk of serious side effects, when there may be safer drug choices.	3	Not Predetermined
Diabetes Treatment	When people with diabetes also have high blood pressure, there are certain types of blood pressure medication recommended. This tells what percent got one of the recommended types of blood pressure medicine.	3	MA-PD: ≥ 86% PDP: ≥ 83%
Medication Adherence for Diabetes Medications	Percent of plan members with a prescription for diabetes medication who fill their prescription often enough to cover 80% or more of the time they are supposed to be taking the medication.	3	Not Predetermined
Medication Adherence for Hypertension	Percent of plan members with a prescription for a blood pressure medication who fill their prescription often enough to cover 80% or more of the time they are supposed to be taking the medication.	3	Not Predetermined
Medication Adherence for Cholesterol	Percent of plan members with a prescription for a cholesterol medication (a statin drug) who fill their prescription often enough to cover 80% or more of the time they are supposed to be taking the medication.	3	Not Predetermined

Using these star ratings, CMS rewards Quality Bonus Payments to Medicare Advantage insurance contracts (including those with and without prescription drug coverage) that perform at the 4-star or higher level. Annually, CMS requires Medicare Advantage plans to submit bids of their cost of providing benefits in a given county. These bids are compared against a benchmark capitated payment that is established by CMS as the estimated cost of providing services for all enrollees per month in particular county. If a plan performs at the 4 to 5 star level, they receive a 5% increase in the benchmark that they bid against. If the plan's bid is below the county benchmark, the plan receives a percentage share of the difference between the bid and the benchmark, called a rebate. Not only does the high performing plan get a percentage increase in the benchmark they bid against, they also receive a higher percentage share of the rebate than lower performing pharmacies. A detailed example is provided in Table 1.2.

In addition to the bonus payments, 5-star plans can enroll beneficiaries at any time during the year while below-average plans cannot even enroll beneficiaries online. As one can imagine, given the previously described benefits, Medicare Advantage plans desire high star ratings. They do not want to be labeled as low performing because this puts them at risk of losing beneficiaries. As a result, Medicare Advantage plans with and without prescription drug coverage are exploring new ways to improve their overall star rating and competition to attract beneficiaries is increasing.

Table 1.2
Calculation of Medicare Advantage Plan Rebate Based on Star Ratings[a]

Plan Star Rating	**Example:** Benchmark	**Percentage increase in Benchmark**	**Example:** Benchmark + Increase	**Example:** Bid Amount	**Example:** Amount Underbid	**Percentage of Underbid Received**	**Example:** Rebate Amount
5 Stars	$750.00	5%	$787.50	$650.00	$137.50	70%	$96.25
4.5 Stars	$750.00	5%	$787.50	$650.00	$137.50	70%	$96.25
4 Stars	$750.00	5%	$787.50	$650.00	$137.50	65%	$89.37
3.5 Stars	$750.00	0%	$750.00	$650.00	$100.00	65%	$65.00
3 Stars or Below	$750.00	0%	$750.00	$650.00	$100.00	60%	$60.00

[a]Shaded columns represent actual benefits for plans that achieve the respective star ratings in 2014.

As of 2014, quality bonus payments were only available to Medicare Advantage plans. Despite not being offered bonus payments, stand-alone Medicare Part D prescription drug plans are currently being evaluated and given star ratings based on 15 measures. Five of these 15 measures account for approximately 47% of the overall stand-alone Medicare Part D prescription drug plan star rating and can be directly impacted by pharmacists and pharmacies. They include:

1. High Risk Medication: The percent of plan members who got prescriptions for certain drugs with a high risk of serious side effects, when there may be safer drug choices.
2. Diabetes Treatment: The percent of plan members with diabetes and high blood pressure who received an angiotensin-converting enzyme inhibitor (ACEI) or an angiotensin receptor blocker (ARB) for their blood pressure.
3. Medication Adherence for Diabetes Medications: The percent of plan members who fill their prescription for diabetes medication enough to cover 80% or more of the time they are supposed to be taking the medication.
4. Medication Adherence for Hypertension: The percent of plan members who fill their prescription for blood pressure medication enough to cover 80% or more of the time they are supposed to be taking the medication.
5. Medication Adherence for Cholesterol: The percent of plan members who fill their cholesterol medication (a statin drug) enough to cover 80% or more of the time they are supposed to be taking the medication.

In the near future, it is possible that quality bonus payments or other incentives may be given to Medicare Part D Prescription Drug Plans (PDPs) for high performance and therefore,

pharmacies that perform poorly could be under heavy pressure to improve their performance (Bonner, 2015).

Pharmacy and the Healthcare Environment

Pharmacies and pharmacists should be working to ensure the right medications get to the right patient, with the right instructions for use, at the right time, at the right price, to achieve the right outcomes (Academy of Managed Care Pharmacy, 2010). As can be seen in the definitions of the CMS adopted measures listed above, pharmacists have the ability to directly impact the measures of adherence and medication safety by encouraging prescription refills and ensuring the use of appropriate medications. Additionally, determination of factors in pharmacies that are associated with high performance on the star rating measures is important as it may help guide pharmacies to best practices that can improve their performance on star rating measures.

In order for pharmacists to focus on improvement of the medication management and medication utilization among their patients as suggested by the CMS adopted measures, they must first be aware that they are being evaluated based on these measures. Little is known regarding the level of awareness of these measures and what initiatives are offered to improve their performance. As such, research on the awareness of pharmacists to these performance measures is needed. Additionally, the extent to which pharmacies offer initiatives that are designed to improve the desired outcomes identified by the star rating system and the extent to which pharmacies monitor their performance on the star rating measures is unknown. Investigation into the association between the use of monitoring platforms and other initiatives to improve quality of care and pharmacy performance level on the CMS star rating measures may lead to increased interest in these initiatives for pharmacies.

Problem Statement

Quality bonus payments are currently being offered to Medicare Advantage plans and may soon be introduced to encourage improvement in performance for Medicare Part D PDPs. Currently, Medicare Advantage and Part D PDPs in Alabama do not perform at the necessary 4 star level to receive quality bonus payments. This warrants investigation into potential opportunities to increase plans' performance in Alabama. As plans attempt to improve the quality of the care they provide, exploration into ideas such as pay-for-performance (P4P) payment models for the pharmacies with which they contract may be on the horizon. In order to improve plans' performance, it would be helpful to know the factors associated with plan performance so that effective strategies can be designed to address these factors.

This dissertation will explore the effect of several groups of independent variables on pharmacy performance including: 1) organizational leaders' awareness, knowledge and attitude toward star ratings and P4P, 2) the quality improvement-related initiatives being offered in pharmacies, and 3) leadership style. A review of the literature has resulted in the conclusion that little is known regarding pharmacist awareness, knowledge, and attitude toward star ratings and P4P models. Additionally, little is known about the quality improvement-related initiatives being offered in pharmacies and whether offering these initiatives is associated with their level of performance. Finally, a better understanding of the relationship between leadership style and pharmacy performance may help us design ways to improve pharmacy performance on medication adherence and safety measures through an improvement in pharmacy organization leadership training.

Leadership has been shown to have a significant relationship with a wide variety of organizational outcomes (Yukl, 2013). Transformational leadership refers to a leader who

enhances employee motivation by connecting with employees to focus on the common goals of the organization (Bass & Riggio, 2006). Transformational leaders are role models that inspire employees to be interested in improving their organization and to take ownership of their work. Transactional leadership refers to a leader who has a relationship with their employees that is based on an exchange of resources. This type of leader has strict guidelines in terms of what followers are expected to do and what they will receive in return. Previous research claims that transformational leadership would be the most effective form of leadership in healthcare organizations yet little research has been conducted to support this in pharmacy. Determination of the association between transformational/transactional leadership and pharmacy performance on the star rating measures may help to better understand what type of leadership is most effective for achieving high performance in pharmacies.

The overall goal of this dissertation is to determine which factors are associated with performance on quality measures. A better understanding of the impact of organizational factors may help promote pharmacist awareness of these factors, facilitate routine performance monitoring, and identify quality improvement-related initiatives that can be implemented to ultimately improve patient outcomes and pharmacy performance. Specifically, this dissertation will explore the effect of leaders' awareness, knowledge, attitude toward performance measures, offering of quality improvement-related initiatives, use of a pharmacy performance monitoring system, and leadership style on global pharmacy performance on the star rating measures.

Specific Aims

Specific Aim 1

Determine high-performing pharmacy leaders' current awareness of star ratings, knowledge of star rating measures, and attitudes towards star ratings and performance measurement as well as current initiatives being offered in pharmacies that are aimed at improving the quality of care provided.

Qualitative interviews with independently-owned community pharmacy owners or managers were conducted. This aim had 2 purposes. The first purpose was to explore awareness and knowledge of star ratings as well as leaders' attitudes toward star ratings and to determine the initiatives that are currently offered in pharmacies to improve medication adherence and safety. The second purpose was to utilize the information learned to formulate a questionnaire that was disseminated to community pharmacies across the state of Alabama to complete Aims 2 and 3.

Specifically, open-ended questions about current awareness and knowledge of the star rating system as well as attitudes towards the system and performance measurement were asked. Questions about the quality improvement-related initiatives being offered in pharmacies were also asked. These quality improvement-related initiates were supported by existing literature and included telephone reminder systems, Medication Therapy Management (MTM), patient education, synchronized medication refills, blister packaging, appointment based models, computerized warning systems for drug-drug interactions and high risk medications, and the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP) quality improvement platform. Finally, questions were included in the interview to gain a better understanding of the leadership functions and style of owners/managers of independently-owned

community pharmacies. A questionnaire utilizing the information gathered from the qualitative interviews and previously published literature was created. This questionnaire was pre-tested using cognitive interviews with a small sample of Alabama pharmacy key informants to ensure clarity of questions.

Specific Aim 2

Explore independently-owned community pharmacy leaders' awareness of star ratings, knowledge of star rating measures, and attitudes towards star ratings and performance measurement as well as the offering of pharmacy quality improvement-related initiatives, the use of EQuIPP and differences in leadership styles in independently-owned community pharmacies in Alabama,.

Dissemination of the previously created and pre-tested self-administered questionnaire to key informants followed the Dillman Method. Key informants were owners or managers of independently-owned community pharmacies in Alabama. Quantitative analysis was conducted to describe the current characteristics of independently-owned community pharmacies in Alabama in regards to awareness, knowledge, and attitudes toward quality measures as well as what quality improvement-related initiatives were being offered and whether the pharmacy used the EQuIPP platform. Comparison between pharmacies among the various predisposing factors, quality improvement-related initiatives being offered, use of EQuIPP and leadership styles were conducted to identify significant relationships.

Specific Aim 3

Determine under what type of organizational leadership the offering of quality improvement-related initiatives and the use of pharmacy performance monitoring software

are associated with pharmacy performance on the CMS adopted measures when controlled for other covariates.

Utilizing pharmacy performance data provided by the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP) paired with the questionnaire data collected from independently-owned community pharmacies in Alabama, quantitative analysis was conducted to determine the relationship between the offering of quality improvement-related initiatives and pharmacy performance on the star rating measures as well as the relationship between the use of the EQuIPP monitoring platform and pharmacy performance on the star rating measures. Additionally, investigation into the modifying effect of transformational and transactional leadership on these relationships was conducted.

Study Significance

This study has the potential to make a significant contribution to 3 areas. First, this study has the potential to improve patient outcomes and public health. By informing pharmacists and pharmacy owners of the organizational characteristics associated with performance on the medication adherence and safety measures, appropriate changes can be made to reach pharmacy performance goals. If pharmacies familiarize themselves with the various initiatives that can be implemented to improve performance and adopt them when possible, patient outcomes could see an improvement. Additionally, this study investigates awareness and knowledge of the star rating system among Alabama pharmacy owners. If pharmacy owners are unaware or lack knowledge of the measures being used to evaluate their performance, recommendations can be made to help improve the dissemination of materials related to the star ratings. This study has the potential to significantly improve awareness and knowledge of the performance measures so

that pharmacies can take appropriate action to improve the quality of the care they provide and, in turn, improve their patients' outcomes.

Second, this study has the potential to inform pharmacy educators and policy makers about the leadership qualities and quality improvement-related initiatives that are associated with pharmacy performance. Currently there is little focus on the development of leadership skills in the pharmacy curriculum. This study may uncover a need to include additional leadership training to future pharmacists. Additionally, this study may promote the need to implement quality improvement-related initiatives in pharmacies and increase the number of pharmacies partaking in these initiatives.

Finally, this study provides the first investigation of transformational and transactional leadership theory and its impact on pharmacy performance. The impact of various pharmacy leadership types on pharmacy outcomes has not been investigated and therefore, this study addresses a significant gap in the pharmacy literature. Previous research on leadership in healthcare organizations focuses on the impact of leadership on individual outcomes, such as worker satisfaction or turnover. This study makes a significant contribution to the literature because it focuses on an organizational outcome, pharmacy performance. By focusing on organizational outcomes, this study may help to build a better understanding of the impact of leadership in healthcare organizations.

Chapter 2. Literature Review

This chapter is separated into the four areas of literature reviewed for this dissertation. First, the background of the U.S. healthcare system is provided. Second, pharmacy performance and the star rating system adopted by the Centers for Medicare and Medicaid Services is described as well as the implications of this rating system for community pharmacy practice. Third, the current quality improvement-related initiatives that are being offered in community pharmacies in an effort to improve patient outcomes and pharmacy performance on quality measures are explored. Fourth, the literature on transformational and transactional leadership theory and the relationship between leadership and organizational outcomes is reviewed. This section also includes a review of previous research that has applied organizational leadership to outcomes in health organizations.

Background of the U.S. Healthcare System and Reimbursement

In 2011, the United States spent more on healthcare per capita and more on healthcare as a percentage of GDP than any other country (World Health Organization, 2012a). Despite being the leader in spending on healthcare, the average life expectancy in the U.S. is less than in many developed countries (World Health Organization, 2012b). In other words, the value of the care delivered by the U.S. healthcare system is lower than in many other countries around the world. There are many factors that may contribute to the high spending on healthcare in the U.S., one of which is the fee-for-service reimbursement system described in the following paragraphs.

In a fee-for-service reimbursement system, a provider is reimbursed based on the procedures and services they provide, regardless of whether or not they are needed. Providers are incentivized to provide higher-cost procedures and services due to their higher reimbursements even if there may be less costly and more appropriate options (Miller, 2012). In essence, this system rewards providers for the volume, as opposed to the value, of the services they provide. Additionally, this type of reimbursement system may actually penalize providers for providing high-quality patient care. For example, in a fee-for-service reimbursement system, a provider whom makes their patient population healthy through high-quality care actually loses money they could gain from providing future services and procedures to those patients (Miller, 2012). In other words, there is no incentive to improve the health of the patient population because doing so will result in fewer opportunities to provide services.

Another issue with fee-for-service reimbursement has to do with the lack of a mechanism to receive an incentive when collaborating or coordinating with other providers to provide care for the same individuals (Miller, 2012). In the U.S. healthcare system, patients have multiple providers, each of which get paid separately for providing services and procedures. This often results in costly duplicate tests and services for patients. There is no benefit to the provider for checking with the patient's other providers to see if they have already received a particular test. Instead, they can provide the procedure or service for the patient a second time and receive reimbursement as well. Similar to this type of reimbursement penalizing providers for providing high quality patient care, fee-for-service penalizes physicians for checking with a patient's other physicians to avoid duplicate tests and services by costing them time and reimbursements. If payment systems were changed to reward the value of the care provided rather than the volume

of services rendered, there may be a reduction in unnecessary costs incurred by the patient and an improvement in patient health.

Introduction of New Pay-for-Performance (P4P) Reimbursement

There is a recognized need to change the fee-for-service reimbursement systems that result in incentives to provide more services to more people and financially penalize providers for improving patient health. New payment systems are being recommended to take the place of fee-for-service that include pay-for-performance (P4P) reimbursement systems in which healthcare providers are paid for providing high quality care and for making significant improvements in the quality of care they provide. The Centers for Medicare and Medicaid Services (CMS) has embarked on a quest to implement value-based purchasing for healthcare services and P4P is the method of reimbursement that has been selected. Some private insurers are also experimenting with P4P as a way to improve quality and reduce costs, many of which are seeing positive results (Robinson, Williams, & Yanagihara, 2009; Yegian & Yanagihara, 2013). A recent study of the effect of a P4P program in 22 primary care practices found that quality of care for patients with diabetes, coronary artery disease, and heart failure improved significantly among all minority groups (Bhalla et al., 2013).

In P4P, performance is measured using metrics that have been determined to reliably define high quality care and optimal health outcomes. These measures are based on the six aims of the U.S. healthcare system: healthcare should be 1) safe, 2) effective, 3) patient-centered, 4) timely, 5) efficient, and 6) equitable (Institute of Medicine (U.S.). Committee on Redesigning Health Insurance Performance Measures Payment and Performance Improvement Programs., 2006). In a P4P reimbursement system, it is important to reward both those who are high performers and those who have made significant improvements over time. This is true because

high performers should be recognized and low performers should be encouraged to make improvements even if they do not believe they can improve enough to be considered a "top" performer (Institute of Medicine (U.S.). Committee on Redesigning Health Insurance Performance Measures Payment and Performance Improvement Programs., 2007). Although relatively new, P4P models have begun to make their way into the reimbursement landscape in the U.S.

Pay-for-Performance in the United States

In the U.S. healthcare system, some P4P models have been implemented in the form of rewards for high quality care while others may penalize for poor patient outcomes. Initially, the majority of P4P programs were sponsored by private insurers. In the early days of P4P, programs primarily targeted primary care physicians and in fact, physician P4P programs outnumbered hospital programs 4 to 1 in 2007. In primary care, the majority of P4P programs offer rewards, not penalties, based on wide range of performance measures. Included in these measures are clinical and efficiency indicators. Additionally, the use of electronic health records and e-prescribing are rewarded in a large number of programs. Recently there has been an increase in the number of state Medicaid programs that are operating P4P programs and Medicare has also instituted national P4P programs.

The Affordable Care Act has expanded the use of P4P programs to encourage improvements in quality of care. One of the most widely known programs created under the law is Accountable Care Organizations (ACOs). In an ACO, a group of providers agree to work together and be held accountable for the quality and costs of the care they provide. In other words, there are incentives in place to check with the members of the ACO before providing unnecessary services because duplicate services will result in a loss of revenue for all members

of the ACO. Another program created under the law is the Medicare Physician Quality Reporting System that provides financial incentives to physicians for reporting quality data to CMS (Health Policy Brief: Pay-for-Performance, 2012). Currently, this program rewards physicians for reporting their quality data with financial incentives. Beginning in 2015, the incentive payments were eliminated and penalties in the form of reductions to Medicare reimbursements were implemented. The Hospital Value-Based Purchasing Program has also been created in which hospitals are rewarded by CMS for their performance on a set of quality measures as well as for any improvement in their performance. Included in this portion of the law is a requirement to expand value-based purchasing to home health agencies, skilled nursing facilities, ambulatory surgical centers, long-term care facilities, and hospice programs (Health Policy Brief: Pay-for-Performance, 2012). The next P4P program that will be described is the star rating system created by CMS to evaluate Medicare insurance plan quality. This system is the focus of this dissertation and the following section describes this system in detail.

Medicare Advantage Star Rating System and Pharmacy Performance Measurement

All Medicare Advantage (MA) plans provide coverage that is comparable to Original Medicare Parts A and B but are administered by private insurers and regulated by the federal government. The majority of Medicare Advantage plans include prescription drug coverage and are called MA-PDs while the plans without prescription drug coverage are referred to as MAs. All Medicare Advantage plans (MAs and MA-PDs) are rated on a quality scale from 1 to 5 stars with 1 star representing poor performance and 5 stars representing excellent performance. The quality star ratings are based on 51 performance measures from 4 sources of data that include: 1) CMS administrative data on plan quality and member satisfaction, 2) the Consumer Assessment of Healthcare providers and Systems (CAHPS®), 3) the Healthcare Effectiveness Data and

Information Set (HEDIS®), and 4) the Health Outcomes Survey (HOS) (Jacobson, Neuman, Damico, & Huang, 2011). For MA plans, 36 of the 51 measures of performance are used to calculate star ratings while MA-PDs are evaluated and rated based on all 51 measures. The performance measures are broken down into 9 areas and are shown in Table 1.1 (in Chapter 1).

The MA and MA-PD star ratings are calculated annually and posted on the CMS website for Medicare beneficiaries to use to compare and select plans. The website highlights the 5 star plans with a special icon to designate their high quality. In previous years, CMS also highlighted the plans that had received less than 3 stars for 3 consecutive years with a warning icon to encourage beneficiaries to consider higher rated plans. Beginning in 2014, plans that perform at a less than 3 star level for 3 consecutive years are no longer able to enroll beneficiaries through the website and risk being dropped from Medicare altogether.

In addition to the helpful features of the star rating system for beneficiaries to compare and select plans, the star ratings are also used to reward highly rated plans with increased reimbursements and Quality Bonus Payments (QBPs). Each plan with a star rating of 4 or more stars is awarded QBPs with the stipulation that the money must be put back into the plan and used to provide additional benefits to their enrollees. This allows the highly rated plans to offer more attractive benefits to their beneficiaries and in turn, increase their enrollment. In addition to the higher reimbursement payments and QBPs, plans that receive 5 stars are able to enroll beneficiaries outside the typical Medicare open enrollment period. Medicare open enrollment is the time period that all eligible individuals are able to enroll in various Medicare plans and occurs between October 15 and December 7 annually. For plans that receive 5 star ratings, beneficiaries can enroll at any time throughout the year. As another added benefit for high performing plans, CMS sends notifications to beneficiaries of poor performing plans that

encourage them to switch to higher rated plans. Because of the benefits of high performance and the penalties to low performers, it is in the best interest of MAs and MA-PDs to improve the quality of their plans.

Of the 51 measures mentioned previously and displayed in Table 1.1, 13 have been deemed to be the most important and have therefore been triple-weighted to more greatly influence the star ratings. Eight of the 13 triple-weighted measures are related to medication utilization and pharmacists' services can affect these measures (Academy of Managed Care Pharmacy & American Pharmacists Association, 2014). These measures include:

1) Diabetes Care – Blood Sugar Controlled: Percent of plan members with diabetes who had an A1C lab test during the year and showed their average blood sugar is under control.
2) Diabetes Care – Cholesterol Controlled: Percent of plan members with diabetes who had a cholesterol test during the year that showed an acceptable level of "bad" (LDL) cholesterol.
3) Controlling Blood Pressure: Percent of plan member with high blood pressure who got treatment and were able to maintain a healthy pressure.
4) High Risk Medication: The percent of plan members who got prescriptions for certain drugs with a high risk of serious side effects, when there may be safer drug choices.
5) Diabetes Treatment: The percent of plan members with diabetes and high blood pressure who received an angiotensin-converting enzyme inhibitor (ACEI) or an angiotensin receptor blocker (ARB) for their blood pressure.

6) Medication Adherence for Diabetes Medications: The percent of plan members who fill their prescription for diabetes medication enough to cover 80% or more of the time they are supposed to be taking the medication.
7) Medication Adherence for Hypertension: The percent of plan members who fill their prescription for blood pressure medication enough to cover 80% or more of the time they are supposed to be taking the medication.
8) Medication Adherence for Cholesterol: The percent of plan members who fill their cholesterol medication (a statin drug) enough to cover 80% or more of the time they are supposed to be taking the medication.

Prescription Drug Plan Star Rating System

In addition to rating MA and MA-PD plans, CMS also assigns star ratings for Medicare Part D prescription drug plans (PDPs). For individuals who choose to enroll in traditional Medicare (Parts A and B), they are given the option to purchase a standalone Medicare Part D PDP for prescription drug coverage. Medicare Part D PDPs are given star ratings based on the last 15 measures included in Table 1.1 and listed above. As described previously, these star ratings can be used by beneficiaries to compare and select plans. Of the 8 triple-weighted measures that can be directly impacted by pharmacist intervention, 5 are medication utilization measures and are included in the Medicare Part D PDP star ratings. These 5 measures account for approximately 47% of the overall plan star rating for PDPs and include:

1. High Risk Medication: The percent of plan members who got prescriptions for certain drugs with a high risk of serious side effects, when there may be safer drug choices.

2. Diabetes Treatment: The percentage of plan members with diabetes and high blood pressure who received an angiotensin-converting enzyme inhibitor (ACEI) or an angiotensin receptor blocker (ARB) for their blood pressure.
3. Medication Adherence for Diabetes Medications: The percent of plan members who fill their prescription for diabetes medication enough to cover 80% or more of the time they are supposed to be taking the medication.
4. Medication Adherence for Hypertension: The percent of plan members who fill their prescription for blood pressure medication enough to cover 80% or more of the time they are supposed to be taking the medication.
5. Medication Adherence for Cholesterol: The percent of plan members who fill their cholesterol medication (a statin drug) enough to cover 80% or more of the time they are supposed to be taking the medication.

In Alabama, there are approximately 435 different contracts offered by insurers that provide prescription drug coverage to Medicare beneficiaries. MA-PD contracts differ by region and therefore, the county in which an individual resides designates which MA-PD contracts are offered to that individual. Of the 435 contracts in Alabama that provide prescription drug coverage, only 37 are Medicare Part D PDPs. Medicare Part D contracts do not differ by county and therefore, there are far fewer contracts to choose from. Hence, the competition to attract beneficiaries is high and high star ratings are valued by Medicare Part D PDPs. At this time, star rating information is available for beneficiaries to use to select PDPs but there are currently no QBPs offered for performance. As the push for greater quality in healthcare continues, bonus payments may be implemented by CMS for Medicare Part D PDPs in the near future.

Medication Utilization Measures

The previous section discussed the movement toward P4P in the U.S. healthcare system and the measures used to determine quality of MA, MA-PD and PDP plans. The 5 medication utilization -related measures are valued highly and therefore will be the focus of this dissertation. The following section summarizes literature related to appropriate medication use and poor adherence to medication regimens as related to these specific measures. The following explains the extent and magnitude of the medication-related problems.

Appropriate medication use. Appropriate medication use is separated into two measures: 1) high-risk medication use and 2) appropriate diabetes treatment. CMS measures high-risk medication use as "the percent of plan members who got prescriptions for certain drugs with a high risk of serious side effects, when there may be safer drug choices".

In regards to the use of high-risk medications, studies have shown that potentially inappropriate medications are prescribed to the elderly population at an alarming rate and are responsible for preventable adverse drug events (ADEs) (Gurwitz et al., 2003; Morandi et al., 2013). A study of ADEs in the elderly population found that approximately 1/3 of the elderly population taking at least 5 medications will experience an ADE each year and approximately 2/3 of these patients will require medical attention (Hanlon et al., 1997). In the elderly, the Beers Criteria identifies 53 medications or medication classes as potentially inappropriate for use in older adults (American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, 2012). Specifically, one study conducted using prescription claims of Medicare Advantage enrollees identified 21% of the elderly population received at least 1 high-risk medication on the Beers list and 4.8% received at least 2 high-risk drugs (Qato & Trivedi, 2013). They also found that individuals living in the Southern United States had a

greater than 10 percent higher risk of receiving a high-risk medication when compared to individuals living in the Northeast (Qato & Trivedi, 2013) which stresses the importance of conducting a study in the Southern region of the U.S. to identify underlying drug utilization problems.

The use of high-risk medications in the elderly has been linked to a variety of negative outcomes. Studies have shown that exposure to these medications can cause increased morbidity, mortality, unplanned hospitalizations, and healthcare spending. A study of nursing home patients in 18 nursing homes conducted by Gurwitz and colleagues (2000) found that over a 12 month period, 546 ADEs occurred. Of the 546 ADEs, 171 (72%) of the 238 fatal, life-threatening, or serious events and 105 (34%) of the 308 significant events could have been prevented. Another study found that patients who experienced preventable ADEs while hospitalized had an average of 4.6 days longer hospitalization and $5,857 higher cost of care (Bates et al., 1997).

The next measure is related to diabetes treatment. CMS measures appropriate diabetes treatment as "the percentage of plan members with diabetes and high blood pressure who received an angiotensin-converting enzyme inhibitor (ACEI) or an angiotensin receptor blocker (ARB) for their blood pressure." High blood pressure is a very common comorbid condition for individuals with diabetes. Research has shown that high blood pressure is associated with a number of complications for individuals with diabetes, such as retinopathy and nephropathy (Arauz-Pacheco, Parrott, & Raskin, 2004). Additionally, individuals with both hypertension and diabetes are twice as likely to develop cardiovascular disease than those with hypertension only (Arauz-Pacheco, et al., 2004). It is recommended that these individuals receive first-line drug therapy with either an ACEI or ARB because of these drugs ability to reduce risk of

cardiovascular disease development and prevent or slow the progression of nephropathy (Arauz-Pacheco, et al., 2004).

Medication adherence. CMS measures medication adherence as the percent of plan members who fill their prescription for diabetes, blood pressure, or cholesterol medication often enough to cover 80% or more of the time they are supposed to be taking the medication. Poor adherence to medication regimens is a well-documented medication-related issue that has significant negative implications for individuals and the population. When a patient does not adhere to their medication regimen they reduce the likelihood that they will improve their condition, make it difficult for providers to determine the optimal treatment for their illnesses, and increase the likelihood that they will have an avoidable hospitalization or even death (Nichols-English & Poirier, 2000). A study in an Australian population found that poor medication adherence was the 2nd leading cause for all ADE related hospitalizations (Phillips et al., 2014). For the U.S. population, non-adherence is estimated to cost the country's economy $100 billion per year in acute care and contributes to our growing resistance to drugs used to treat infectious diseases (Connor, Rafter, & Rodgers, 2004; Nichols-English & Poirier, 2000).

The reasons people are not adherent to medication regimens are vast and complex. Many individuals stop taking their medications because of cost concerns, a lack of belief that the medication is working, the medication makes them feel worse, or because they lack an understanding regarding their need to take the medication in the first place (Pasina et al., 2014). Many interventions have been studied and have resulted in improved medication adherence; some of which are explained in greater detail in the section of this review focused on pharmacy efforts in quality improvement-related initiatives below. Overall, medication non-adherence is a

preventable problem that can be positively affected by pharmacists managing and monitoring patients' medication use.

Pay for Performance in Pharmacy

Although pharmacists have the potential to positively affect improper medication use, the current payment structure used by the majority of payers in the U.S. healthcare system does not incentivize pharmacists to do so. In fact, there is almost a disincentive to spend time monitoring and managing patient medication use as a result of the current pharmacy payment structure. Pharmacies are currently paid based on the sale of pharmaceuticals to patients regardless of whether or not those products work for those patients. In other words, spending time with patients and finding out whether or not the medications are working actually takes away from time they could be using to dispense medications and therefore takes away from the potential to make more money. This is analogous to the way providers are paid on a fee-for-service basis that does not incentivize comprehensive patient care and communication between multiple providers of the same patient. In pharmacy and in other healthcare settings, this payment structure based on process has led to poorer health outcomes. In fact, researchers have estimated that for every dollar spent on medications, another dollar is spent treating the problems associated with poor medication use and therefore, billions of dollars are wasted annually (Warholak & Nau, 2010). In order to reduce the high amount of wasted healthcare dollars and improve patient outcomes, changes in the way pharmacists and other healthcare providers are paid for their services are on the horizon.

As previously explained in detail, the U.S. healthcare system is slowly moving toward value-based purchasing in which providers are evaluated based on the quality of services they provide and the costs associated with these services. In pharmacy, this quality improvement

focus is being led by the Pharmacy Quality Alliance (PQA), State Boards of Pharmacy, national and state pharmacy associations, and pharmacy schools. Currently, community pharmacies are not required to report performance to accreditation organizations or government agencies which is dissimilar to the majority of healthcare organizations. This may be changing in the future as value-driven payment structures are put into place for pharmacy.

In community pharmacy, P4P is becoming more of a reality with the increased measurement of MA-PD and PDP performance and increased transparency of performance. As the demand for information about the quality of healthcare provided by health plans, physicians, hospitals, and long-term care facilities increases, it is only a matter of time before pharmacies and pharmacists are expected to report their performance or for MA-PD and PDP plans to reward or penalize pharmacies for their performance. Because pharmacists can directly impact the quality of their patients' medication use (high-risk medication utilization, appropriate medication utilization and medication adherence) through MTM and other quality improvement-related initiatives, a P4P model that includes pharmacists or pharmacies could help improve patient outcomes.

Involving pharmacies or pharmacists in P4P models is not a new concept. A variety of P4P models with different target outcomes have been implemented by private payers. For example, some private payers involve pharmacies to increase the rate of utilization of generic drugs (Inland Empire Health Plan, 2014). In such a model, pharmacies that have a low percentage of their patients on brand name medications when a generic equivalent is available would receive a bonus payment from the private plan. Expanding the P4P model to community pharmacies based on performance measures that are rooted in patient outcomes is needed and has already begun on a small scale (Inland Empire Health Plan, 2014).

Pharmacy Effort in Quality Improvement Initiatives

There are many initiatives that community pharmacies can partake in or implement to improve medication-related issues and the quality of the care provided to patients. In the following paragraphs, initiatives designed to achieve the outcomes of interest (high-risk medication utilization, appropriate medication use and medication adherence) as well as the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP), a pharmacy performance monitoring platform, are discussed. The majority of the literature that has examined the effect of these initiatives on the outcomes of interest utilized experimental designs. After an experimental study in a pharmacy, many initiatives are abandoned due to lack of funding or support to sustain the initiative (Paine-Andrews, Fisher, Campuzano, Fawcett, & Berkley-Patton, 2000). Therefore, the extent to which these initiatives are actually implemented in pharmacies is unclear. The following section will review the previously published literature on system-level initiatives and the use of quality monitoring platforms in pharmacies to improve medication-related outcomes.

To address medication safety and the use of high-risk medication in the elderly, many community pharmacies have computerized alert systems that make the pharmacist aware of a potential drug-drug interaction or high-risk medication. These systems have been shown to reduce the number of dispensed medications that may result in a drug-drug interaction but there is also concern that many pharmacists suffer from alert fatigue and simply override or ignore the alerts when they occur (Saad et al., 2007). One study suggested that action by a pharmacist was much more likely after an alert that was considered “severe” than an alert that was considered “moderate” or “minor” (Indermitte, Beutler, Bruppacher, Meier, & Hersberger, 2007). Even

still, action that may not have occurred without the system is thought to improve the safety of medication use overall.

To address low adherence to medication regimens among patients, some community pharmacies have implemented initiatives that aim to remind patients to take their medications. To remind patients to take their medications, one commonly implemented initiative is a reminder system that informs the patient they are due for a refill. These systems will call or text the patient when they are due to refill their medication, often providing an option to contact the pharmacy with any questions. Research has demonstrated that these systems increase refill rates (Ascione, Brown, & Kirking, 1985; Petrilla, Benner, Battleman, Tierce, & Hazard, 2005). Because the measures adopted by CMS estimate medication adherence based on pharmacy fill data, pharmacies that encourage their patients to refill their prescriptions with a reminder system may perform at a higher level on the medication adherence measures than pharmacies without such systems.

Patient education has also been studied as a way to improve medication adherence. There are many different forms of patient education and counseling initiatives that range from simple activities such as providing written material about the side effects one may experience as a result of non-adherence to more complex activities, such as group educational meetings for patients with similar conditions (McDonald, Garg, & Haynes, 2002). A review of studies conducted on initiatives to improve adherence in pharmacies found that education initiatives had a positive effect on adherence in some studies but the quality of the studies included in the review was determined to be low (Van Wijk, Klungel, Heerdink, & de Boer, 2005). Another study of initiatives in pharmacies showed that patient education resulted in an increase in patient adherence to medications (McDonough & Doucette, 2003). Additionally, one study found that

states with laws that require more counseling and education for patients picking up prescriptions had higher medication adherence rates than states with less intense regulations (Svarstad, Bultman, & Mount, 2004).

Another initiative that is used by pharmacies to improve medication non-adherence is blister or bubble packaging. Blister packaging is an adherence aid that has been shown to reduce the complexity of medication regimens for patients with multiple chronic conditions by pre-packaging all the medications for one individual in cells or "blisters" that are broken down by time of day medications should be taken, number of doses that should be taken per day, etc. A systematic review of randomized controlled trials that compared blister packaging to usual pill containers found that the majority of studies (8 out of 10) found significantly better adherence to medication regimens in the blister packaging group than the usual pill container group (Connor, et al., 2004).

Another initiative that has the ability to address both medication non-adherence and the use of high-risk medications in the elderly is Medication Therapy Management (MTM). MTM is a patient-centered service that focuses on managing all of a patient's medications by evaluating the medications and their impact on the patient's illnesses. The American Pharmacists Association (2008) states that MTM services include a minimum of 5 core elements: 1) medication therapy review, 2) personal medication record, 3) medication-related action plan, 4) intervention and/or referral, and 5) documentation and follow-up. Through these standardized elements, a pharmacist first determines if the patient is taking any medications that may be inappropriate, ineffective, unsafe, on inconvenient for the patient and then makes changes, through collaboration with the patient's physician, to improve the patient's experience with the medications and maximize the benefits the patient will receive from the medications. Then, the

pharmacist works with the patient to create an action plan that includes goals for the patient to achieve regarding their medication use and illnesses. Finally, the pharmacist follows-up with the patient on a regular basis to evaluate how the patient is dealing with their medications, if they are experiencing the desired outcomes, and if they are achieving their goals. Studies have shown that this pharmacist and patient interaction can significantly improve adherence to medication regimens and patient outcomes (Petrilla, et al., 2005).

In regards to platforms that can be implemented in pharmacies to monitor pharmacy performance on the star rating measures, one innovation that can be used to identify problem areas and drive continuous quality improvement is the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP). EQuIPP is a problem identification tool that allows pharmacies to assess their own performance over time. EQuIPP is the result of collaboration between Pharmacy Quality Solutions and CECity and is an innovative performance information management platform that makes unbiased, benchmarked performance data available to both health plans and community pharmacies. EQuIPP can be purchased by pharmacies and plans to monitor their performance on various performance measures including the measures adopted by CMS. Phase 1 and beta phase demonstration projects have shown EQuIPP's ability to aid pharmacies to significantly improve their star ratings over a 1 year time period (Doucette et al., 2011; Nau, 2013).

Background of Organizational Leadership Research

Many factors may influence participation in quality improvement (QI) in community pharmacies. The previous section described various initiatives that can be offered in community pharmacies that have been shown to affect quality of care provided in pharmacies. QI is a continuous focus that is based on 3 dimensions: structure, process and outcome. For example,

having a policy requiring pharmacists to talk with patients when dispensing a new medication is a structure and having pharmacists comply with the policy is a process. Having both would affect quality of care which is an outcome. Affecting the performance of the pharmacy through participation in QI initiatives requires all members of the organization to be involved and therefore, this dissertation seeks to examine the effect of organizational leadership in pharmacies on the offering of QI-related initiatives and QI participation.

While leaders have been around for centuries, the term "leadership" and more specifically how leadership if defined and how leaders influence their subordinates is a relatively new area of interest. In the past few decades, many different scholars have attempted to tackle leadership and as a result, numerous definitions and models of leadership exist. In fact, an article published over 20 years ago claimed that, at the time, there were 221 different definitions of leadership (Rost, 1993). The GLOBE study is one of the most recognized studies of leadership and was conducted with representatives of 62 counties. In this seminal work, leadership is defined as "the ability to influence, motivate, and enable others to contribute to the effectiveness and success of the organizations of which they are members (House & Global Leadership and Organizational Behavior Effectiveness Research Program., 2004). In this definition, the leader is very clearly tied to the organization's outcomes. Although this definition may be an appropriate definition to some, the appropriate definition of leadership for a given researcher depends on the specific aspect of leadership that is of interest to that researcher (Bass & Bass, 2008).

Over time, the number of theoretical lenses that exist and can be used to examine leadership has grown. Some commonly used leadership theories include Trait and Behavioral theories, Situational and Contingency theories, Functional Leadership theory, Information-Processing theory, Self Leadership theory, and Transformational and Transactional leadership

theories. For this dissertation, Transformational and Transactional Leadership theories will be the focus.

Transformational and Transactional Leadership Theory

Burns (1978) described two types of leadership known as transformational and transactional. Burns explained that these two leadership types are polar opposites on a single continuum. Both leadership styles refer to the way a leader in an organization interacts with his or her followers. A transformational leader has a relationship with followers that is based on a shared set of goals and a determination of the followers' needs. This type of leader motivates followers by involving them in multiple aspects of the job and creating an intellectually stimulating work environment (Avolio, Bass, & Jung, 1999). On the other hand, a transactional leader has a relationship with followers that is based on an exchange of resources. This type of leader has strict guidelines in terms of what followers are expected to do and what they will receive in return.

Bernard Bass (1985) built on Burns (1978) findings and hypothesized a leader did not necessarily fall on one end of the transformational – transactional leadership spectrum but could have both transformational and transactional characteristics. This led Bass to focus more on the characteristics of transformational leaders. In his study of military officers, exploratory factor analysis of data collected via a 73-item questionnaire resulted in 3 distinct dimensions of transformational leadership: 1) charismatic leadership, 2) individualized consideration, and 3) intellectual stimulation. In the years since the initial 3 dimensions of transformational leadership were identified and named, an additional dimension called "inspirational motivation" has been added and the charismatic leadership dimension has been renamed "idealized influence" to create the 4 I's of transformational leadership (Avolio, Waldman, & Yammarino, 1991). The 4 I's are

listed and defined in Table 2.1 (Bass & Bass, 2008). Transformational leaders exhibit the 4 I's to obtain the wanted organizational outcomes through their followers. A leader high in Idealized Influence is seen by followers to be impressive and to have qualities that they themselves would like to have. A leader that has the ability to motivate and inspire their followers by being enthusiastic and optimistic is high in Inspirational Motivation. Individualized Consideration means that the leader supports followers and creates learning opportunities while acting as a coach or mentor. Lastly, leaders who allow openness without fear of criticism and trust in their followers' problem solving abilities are high in Intellectual Stimulation.

Table 2.1
The 4 I's of Transformational Leadership[a]

Transformational Leadership Dimension	Definition
Individualized Consideration	The degree to which the leader recognizes the follower's needs and acts as a mentor to develop the follower. This leader also gives empathy and support while appropriately recognizing each follower's individual contribution to the team.
Intellectual Stimulation	The degree to which the leader encourages followers to be innovative and challenge the status quo. This leader has no problem replacing an old way of doing things if it is found to be ineffective.
Inspirational Motivation	The degree to which the leader articulates a vision for the organization that appealing and motivating to the followers. This leader has strong communication skills and as a result, the follower invest more effort in their tasks and are optimistic about the future.
Idealized Influence	The degree to which the leader acts as a role model and is admired by followers. This leader respects others and encourages followers to do better while putting the followers' needs above their own.

[a]Adapted from Bass & Bass (2008)

Measurement of Transformational and Transactional Leadership

Multiple measures have been created over the years to assess transformational and transactional leadership. The Multifactor Leadership Questionnaire (MLQ) created by Avolio and Bass (Bass & Avolio, 1990) is currently in its 3rd edition and is the most commonly used measure of transformational and transactional leadership. The MLQ has been used in a wide variety of organizations both in field and laboratory research that include military, government, educational, manufacturing, correctional, volunteer, and hospitals (Bass & Avolio, 1990). The current version of the MLQ (5X short) has 45 items that identify and measure leadership behaviors and leader characteristics that have been shown to be strongly associated with both individual and organizational success (Bass & Avolio, 1990).

The Transformational Leadership Behavior Inventory (TLI) was developed by Podsakoff and colleagues (Podsakoff, MacKenzie, Moorman, & Fetter, 1990) and is the second most frequently utilized measure of transformational leadership. Similar to the 4 I's of transformational leadership, the TLI measures the 4 core dimensions of transformational leadership. In the first dimension, questions about the leader's ability to articulate a vision, act as an appropriate role model, and motivate employees to look beyond themselves to the good of the group are asked. In the next section, questions covering the 3 dimensions of individualized support, high performance expectations, and intellectual stimulation are asked.

There are a number of other measures of transformational and transactional leadership that are used less frequently but have been shown to yield positive results. These measures include the Leadership Assessment Inventory (Burke, 1994), Transformational Leadership Questionnaire (Alimo-Metcalfe & Alban-Metcalfe, 2001), the Global Transformational Leadership Scale (S. A. Carless, Wearing, & Mann, 2000), a 15-item scale of transformational

leadership by Rafferty and Griffin (2004), and the Follower Belief Questionnaire and Attributes of Leader Behavior Questionnaire, both created by Behling and McFillen (1996). For this dissertation, questions from the most frequently used measure, the MLQ (5X short), will be utilized.

Brief Review of Previous Research on Transformational Leadership

As previously mentioned, the past 30 years have seen an increased interest in transformational and transactional leadership among a great number of researchers. As such, research on transformational and transactional leadership and their impact on a wide variety of outcomes, both organizational and individual, have been explored. This dissertation is concerned with organizational performance and will therefore focus on previously published research on organizational outcomes.

Research has shown a positive correlation between transformational leadership and organizational performance (Díaz-Sáenz, 2011). A study that utilized a sample of sales representatives for a large pharmaceutical corporation found that the transformational leader's ability to express optimism in times of frustration had a positive impact on followers' performance (McColl-Kennedy & Anderson, 2002). In another study conducted in 20 Austrian banks, transformational leadership was found to impact long-term organizational performance outcomes positively but had no significant relationship with short-term outcomes (Gong, Huang, & Farh, 2009). Other performance-related organizational outcomes have also been studied at the organizational level. For example, in a literature review of the impact of transformational leadership on job and career satisfaction as well as turnover and turnover intentions, researchers described studies in education, government, nursing, banking and athletics that all saw positive impact of transformational leadership (Riaz & Haider, 2010). Other organizational outcomes

such as employee commitment, trust, and organizational citizenship behaviors have also been found to be positively impacted by transformational leadership (Podsakoff, MacKenzie, & Bommer, 1996).

Although the relationship between transformational leadership and performance has been shown numerous times throughout the published literature, the method for measuring performance has traditionally been qualitative in nature. In other words, performance was based on individuals' assessments of their performance and not measurable data. Additional research that utilizes performance data that are not collected via self-report is needed to address this gap in the current literature.

Review of Transformational Leadership Research in Healthcare Organizations

In healthcare organizations, transformational and transactional leadership has been investigated with varying results and with the majority focusing on individual level outcomes such as satisfaction, burnout, commitment, and engagement. One healthcare field gaining interest in the effects of transformational and transactional leadership on work outcomes seems to be nursing. An example of this newfound interest is a study that investigated the relationship between transformational leadership and work engagement among 240 nurses at an Iranian government hospital (Hayati, Charkhabi, & Naami, 2014). Work engagement was defined as the amount of energy a person puts into their work as well as the effectiveness and efficiency of that work (Maslach & Leiter, 2008). Utilizing the Multifactor Leadership Questionnaire, this study found that transformational leadership was positively associated with work engagement. Another example in nursing is a study that found transformational leadership to be significantly related to increased job satisfaction and staff well-being as well as decreased burnout and overall stress (Weberg, 2010). Additionally, transformational leadership was shown to have a positive

impact on organizational performance in a study conducted in a teaching hospital that found transformational leaders were associated with higher morale which led to greater work group innovation that directly benefited patients (Wilson-Evered, Härtel, & Neale).

Although some previous research has been conducted in healthcare organizations and the concepts of transformational and transactional leadership seem to be gaining traction (especially in nursing), the relationship with performance on organizational outcomes, such as performance on quality-related measures, is lacking. It is thought that transformational leadership would be the most effective form of leadership in healthcare organizations because of the constant need to embrace change in the healthcare environment (Firth-Cozens & Mowbray, 2001). Although some think transformational leadership would be most effective at improving the quality of care in healthcare organizations, empirical research is needed on the relationship between leadership style and performance on quality measures in community pharmacies. A better understanding of this can help determine appropriate training strategies for current and future pharmacy owners/managers.

Despite claims that transformational leadership would be the most effective form of leadership to improve the quality of care in healthcare organizations, relatively little empirical research has been published in this area. A systematic search for peer-reviewed publications among relevant databases resulted in the identification of articles related to leadership in pharmacy but no research on the effects of transformational or transactional leadership. For example, one qualitative study conducted in 4 Danish pharmacies attempting to implement a cognitive pharmaceutical service found that leadership impacted the likelihood that the service would be sustained (Kaae, Søndergaard, Haugbølle, & Traulsen, 2011). Because this study was focused on a particular event (the implementation of a new service), the authors chose to use a

situational leadership model, Bolman and Deal's Four Frame Model (2008), and therefore were not looking at leadership style overall but only for a specific situation. Hence, with searches yielding no studies, there is a clear gap in the literature related to the role of the owner/manager/leader in community pharmacies in the U.S.

Chapter 3. Methods

The specific aims of this dissertation are to: 1) determine high-performing pharmacy leaders' current awareness of star ratings, knowledge of star rating measures, and attitudes towards star ratings and performance measurement as well as current initiatives being offered in pharmacies that are aimed at improving the quality of care provided, 2) explore independently-owned community pharmacy leaders' awareness of star ratings, knowledge of star rating measures, and attitudes towards star ratings and performance measurement as well as the offering of pharmacy quality improvement-related initiatives, the use of EQuIPP and differences in leadership styles in independently-owned community pharmacies in Alabama, and 3) determine under what type of organizational leadership the offering of quality improvement-related initiatives and the use of pharmacy performance monitoring software are associated with pharmacy performance on the CMS adopted measures when controlled for other covariates. The specific research questions and study hypotheses are provided in the following sections.

Research Questions and Study Hypotheses

The overarching goal of this dissertation was to determine which factors were associated with pharmacy performance on quality measures in an effort to promote pharmacist awareness of these factors, facilitate routine performance monitoring, and identify initiatives that can be offered to ultimately improve patient outcomes and pharmacy performance. Specifically, this study used transformational and transactional leadership theory as guidance to propose the relationships between variables depicted in Figure 3.1. Additionally, predisposing factors of

awareness of star ratings, knowledge of star rating measures, and attitudes towards star ratings and performance measurement were included as they may influence the offering of quality improvement-related initiatives or the use of pharmacy performance monitoring software. The next two sections list the specific research questions and study hypotheses.

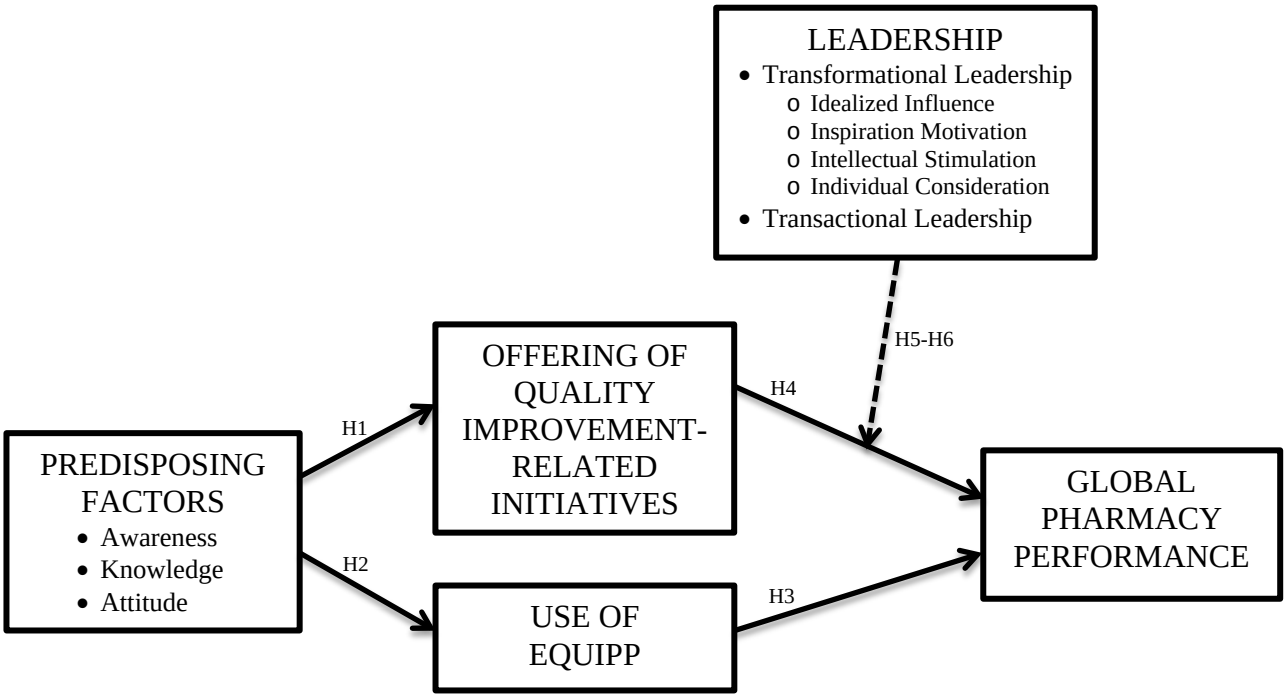


Figure 3.1. Model of Hypothesized Relationships between Variables

Research Questions

The research questions addressed for this dissertation were:

RQ1. What is the current awareness, knowledge, and attitude of pharmacy owners in relation to the Medicare star rating measures?

RQ2. What initiatives are offered by pharmacies to improve the quality of the care they provide?

RQ3. What leadership styles are present in independently-owned community pharmacies?

RQ4. What is the relationship between pharmacy predisposing factors and the offering of pharmacy quality improvement-related initiatives and the use of EQuIPP?

RQ5. What is the relationship between the offering of pharmacy quality improvement-related initiatives and the use of EQuIPP and pharmacy performance on the star rating measures?

RQ6. How does leadership style modify the relationship between the offering of pharmacy quality improvement-related initiatives and performance on the star rating measures?

Study Hypotheses

The hypothesized relationships between study variables are depicted in Figure 3.1. The following hypotheses were tested:

H1. Predisposing factors will have a relationship with the offering of pharmacy quality improvement-related initiatives.

H2. Predisposing factors will have a relationship with the use of EQuIPP.

H3. Use of EQuIPP will have a relationship with global pharmacy performance.

H4. The offering of pharmacy quality improvement-related initiatives will have a relationship with global pharmacy performance.

H5. Transformational leadership will positively modify the relationship between the offering of pharmacy quality improvement-related initiatives and global pharmacy performance.

- **H5a.** Idealized Influence will positively modify the relationship between the offering of pharmacy quality improvement-related initiatives and global pharmacy performance.
- **H5b.** Inspiration Motivation will positively modify the relationship between the offering of pharmacy quality improvement-related initiatives and global pharmacy performance.

H5c. Intellectual Stimulation will positively modify the relationship between the offering of pharmacy quality improvement-related initiatives and global pharmacy performance.

H5d. Individual Consideration will positively modify the relationship between the offering of pharmacy quality improvement-related initiatives and global pharmacy performance.

H6. Transactional leadership will negatively modify the relationship between the offering of pharmacy quality improvement-related initiatives and global pharmacy performance.

Overview of the Study Design

An exploratory, mixed-methods design was employed to address the research questions and test the hypotheses above. Data collection and analysis was conducted in 2 major phases.

Phase I: Qualitative Study

To determine high-performing pharmacy leaders' current awareness of star ratings, knowledge of star rating measures, and attitudes towards star ratings and performance measurement as well as current initiatives being offered in pharmacies that are aimed at improving the quality of care provided (Specific Aim 1), a qualitative study design was utilized. Telephone interviews using open-ended questions with key informants were conducted. Key informants were defined as pharmacy owners and/or managers of independently-owned community pharmacies in Alabama. Pharmacy owners/managers of independently-owned community pharmacies were selected because of their ability to make changes to their organizations and their leadership role within their organizations. With other community pharmacy ownership types (chain, grocery, mass merchandiser), major decisions are typically made in the upper levels of management, not at the individual pharmacy level.

Initial interview questions covered general services offered in their respective pharmacies as well as awareness of the Medicare Advantage prescription drug plan measures that can be directly impacted by the pharmacist and perceived characteristics of pharmacy leaders. Based on respondent answers, common interview techniques attempted to elicit additional information from the participants. The IRB protocol for phase I of this study was approved and received exempt status.

Study Population and Sampling

Sampling for phase I utilized a selective and purposeful approach. A list of all independently-owned community pharmacies in Alabama was utilized to select potential participants. Using pharmacy performance data as measured by the CMS adopted performance metrics, a list of 15 high-performing independently-owned pharmacies were identified by Dr. David Nau, CEO of Pharmacy Quality Solutions. Once the list was acquired, each pharmacy received a telephone call inviting them to participate in the study. During recruitment, an IRB approved script was used to inform the potential participants of the purpose of the study and schedule an interview with the principal investigator. Before conducting the interview with key informants who agreed to participate, an information letter was read over the phone and the contact information of the principal investigator and his advisor were provided in the event that the participant had any questions following the interview. Recruitment documents for Phase I can be found in Appendix A. A minimum of 10 pharmacy key informants were needed for this phase of the study but recruitment did not end until the saturation point had been reached. The saturation point is the point at which no new information would be gained from conducting additional interviews with key informants.

Data Collection

Telephone interviews were conducted with key informants of independently-owned community pharmacies in Alabama to generate data. One hour long appointments were made at each key informant's convenience. Questions covered general services offered in their respective pharmacies as well as awareness of the Medicare Advantage prescription drug plan measures that can be directly impacted by the pharmacist. These questions were categorized into 3 sections and listed below:

Section 1: General services offered:

1. Aside from dispensing medications, what kinds of services are commonly offered in your pharmacy for patients?
2. When I say "activities to improve quality of care in pharmacies" what kinds of activities do you think of?
3. What activities would you say improve the quality of the care you provide in your pharmacy?
4. What, if anything, do you do to encourage your patients to be adherent with their medication regimens?
5. What systems, if any, do you have in place to avoid dispensing high-risk medications to the elderly?
6. If a patient has hypertension and diabetes but is not prescribed an ACEI or ARB for their hypertension, what do you do? Are you comfortable contacting the patient's physician to suggest addition of an ACE inhibitor or angiotensin-receptor blocker? Explain.

Section 2: Predisposing factors

1. What do you know about the Medicare star rating system for insurance plans?
2. What do you think about the measures and the Medicare star ratings?
3. What do you think about performance on these measures being used to determine a portion of the payment *plans* receive?
4. What, if anything, do you believe a pharmacist can do to impact a plan's performance on the Medicare star rating measures?

   4a. If mention of the medication utilization-related measures: In your own words, explain how performance is calculated for these measures.

   4b. If mention of the medication utilization-related measures: What do you do, if anything, to monitor your performance on these measures?

      4b1. If something: What do you do when you realize you are not performing at the level you desire?

      4b2. If something but not EQuIPP: Have you heard about the EQuIPP platform? If yes, what do you know about it?

      4b3. If nothing: Why?

      4b4. If nothing: Have you heard about the EQuIPP platform? If yes, what do you know about it?
5. What do you think about performance on these measures being used to determine a portion of the payment *pharmacies* receive?

Section 3: Leadership

1. Have you talked with your employees about the performance measures or star ratings?

2. If you decided to make a change to improve quality, who, if anyone, would you talk with to get feedback on your idea? How might you approach the initiative?
3. Do you think that if you were to make a change to improve quality you would have to delegate new responsibilities to particular employees or encourage all the employees to rally behind the pharmacy's new performance goal? Why do you think that would be?

All interviews were recorded using a digital voice recorder. Key informants were ensured that their identities would remain confidential at all points during the study. To ensure confidentiality, each key informant was coded with a random number and all recorded interviews were kept separate from the identifying code list. Recorded interviews were transcribed verbatim in a Microsoft Word document for analysis.

Data Analysis

Analysis of interview data was conducted using ATLAS.ti qualitative analysis software. Utilizing a data-driven approach, approximately half of the dataset was first open-coded independently by 2 coders to generate initial codes. After the code list had been determined, the entire dataset was re-coded by both coders with the new, final code list. Once complete, themes were identified based on frequency of codes. Additionally, particularly interesting codes were set aside for potential inclusion in the questionnaire. Krippendorf's alpha was calculated using the Coding Analysis Toolkit to determine inter-coder reliability. Based on the findings from analysis of the interviews as well as existing literature, questions were developed for the questionnaire.

Phase II: Quantitative Study

To explore independently-owned community pharmacy leaders' awareness of star ratings, knowledge of star rating measures, and attitudes towards star ratings and performance measurement as well as the offering of pharmacy quality improvement-related initiatives, the use of EQuIPP and differences in leadership styles in independently-owned community pharmacies in Alabama (Specific Aim 2) and to determine under what type of organizational leadership the offering of quality improvement-related initiatives and the use of pharmacy performance monitoring software are associated with pharmacy performance on the CMS adopted measures when controlled for other covariates (Specific Aim 3), a cross-sectional study design was utilized. Data used to accomplish these two aims was collected from two sources: 1) a self-administered questionnaire to gather pharmacists' knowledge, awareness and attitudes as well as offered quality improvement-related initiatives and organizational leadership and 2) pharmacy performance data from EQuIPP via Pharmacy Quality Solutions and CECity. The questionnaire was informed by the qualitative interviews used to accomplish Specific Aim 1 and was sent to randomly-selected independently-owned community pharmacy owners/managers across the state of Alabama.

Study Population and Sampling

Sampling for phase II utilized a random approach. A list of all independently-owned community pharmacies in Alabama was obtained from the Hayes Retail Pharmacy Directory. The Hayes Retail Pharmacy Directory is updated twice a year in April and October. It features a comprehensive list of the 60,109 retail drug stores in the United States. The database contains 16 separate fields, including NAME, ADDRESS, MAIL ADDRESS, CITY, STATE, ZIP, PHONE, FAX, COUNTY, POPULATION (CITY), CHAIN OR INDEPENDENT, CHQ (Headquarters

Location), STORENUM (UNIQUE ID), BRANCH, OTHER (comments) and FULLSTATE. In Alabama, the Hayes Retail Pharmacy Directory lists 1220 pharmacies, of which 523 are identified as independently-owned. From the list of 523 independently-owned community pharmacies in Alabama, 350 were randomly selected for recruitment.

A power analysis was conducted to determine the appropriate sample size for this study. To conduct the power analysis, four factors were considered: 1) sample size, 2) alpha level, 3) statistical test, and 4) effect size. The commonly used alpha level of 0.05 was established to determine statistical significance of statistical tests (Cohen, 1988). Power is also impacted by the type of statistical test being conducted because statistical significance is determined based on the statistical test being utilized. This study utilized linear and multiple linear regression statistical tests.

Effect size is another important determinant of power. It is suggested that the effect size used to calculate power be estimated using previous research. Since the current study is not similar to previous research, effect size was set at 0.15. This is commonly considered adequate level for studies utilizing multiple regression in the behavioral sciences (Pedhazur, 2005).

Statistical power level was set at the conventional level of 0.80 (Cohen, 1988). This study utilized 9 predictor variables and between 0-2 control variables, depending on the model. Using the effect size of 0.15, alpha level of 0.05, power of 0.80, and 9-11 predictor variables (9 independent variables and 0-2 control variables), a minimum sample size of 113-122 participants was needed.

A review of survey response rates found that the average response rate for studies that utilize data gathered from individuals was 52.7% while the average response rate for studies that utilize data gathered from organizations was 35.7% (Baruch & Holtom, 2008). Based on these

findings, a response rate of 35% was estimated for this study. Given our estimated response rate and minimum sample size of 113-122 participants, 350 randomly selected independently-owned community pharmacies in Alabama were recruited to participate. Pharmacy owners or managers served as the key informants for their respective pharmacies.

Data Collection

Questionnaire distribution followed a modified version of Dillman's Tailored Design Method (Dillman, 2000) that included a total of 5 contacts: a pre-notification postcard, the first questionnaire packet, a reminder postcard, a reminder phone call, and a replacement questionnaire packet.

Specifically, one week before the questionnaire was distributed a brief pre-notification postcard was mailed to all potential participating pharmacies notifying them that a questionnaire packet would be arriving in the coming days and that their participation would be appreciated. The notification postcard is found in Appendix B. Following the pre-notification postcard, the first questionnaire packet was mailed to all potential participating pharmacies. The first questionnaire packet included the following items: 1) two copies of the IRB-stamped informed consent form, 2) the study questionnaire, and 3) an addressed and postage-paid return envelope. The IRB-stamped informed consent (Appendix C) informed each participant their participation was completely voluntary as well as their rights as a participant. The informed consent form laid out the purpose of the study and described the lottery incentive they were eligible to receive if they chose to participate. The lottery incentive offered to participants stated that each participant who completed the questionnaire and returned the signed informed consent form would be entered in a raffle for the chance to win 1 of 6 $50 cash prizes. It also informed the participants that if they chose to participate, they would be allowing the principal investigator to access their

performance scores calculated and compiled by Pharmacy Quality Solutions and CECity. To gain consent, each participant was required to initial and sign one copy of the informed consent form and include it in the return envelope with their completed questionnaire. Next, two weeks after distribution of the questionnaire packet, a reminder postcard (Appendix D) was sent to all pharmacies that had not yet returned the questionnaire. This postcard emphasized the lottery incentive that they would be eligible to receive if they participated and the importance of their responses in the continued effort to expand the role of pharmacists in healthcare and improve patient and public health. Ten days after the reminder postcards were sent, a reminder telephone call was made to all pharmacies that had not yet responded. The interaction followed an IRB-approved script (Appendix E) and questioned whether or not the pharmacy had received the questionnaire, if they were planning on completing it, and if they would like for a copy to be resent to them. Finally, 3 days after the reminder telephone call, a replacement questionnaire packet that included 2 copies of the informed consent form, the questionnaire, and an addressed and stamped return envelope was sent. All mailings ensured participant confidentiality and stressed the importance of their participation.

Data Entry and Management

All completed questionnaires were returned to a locked mailbox at the Department of Health Outcomes Research and Policy in the Harrison School of Pharmacy at Auburn University. Each business day the mail was checked by the researcher. A Microsoft Excel spreadsheet was created to record the postmark of all responses when they were received in order to identify early and late responders. Additionally, this spreadsheet was used to record individuals who reported not receiving any or all of the mailings from the United States Postal Service.

All data from returned questionnaires was coded and entered into SPSS version 23.0 by the principal investigator. The principal investigator double checked the entered data for accuracy. After data collection and entry were complete, the researcher calculated frequencies for all variables to determine incomplete data and to identify any abnormal entries that may have been missed during data entry.

Organization of the Questionnaire

The questionnaire was developed using a combination of questions from validated measures and newly developed questions informed by the qualitative interview analysis in Phase I. The questionnaire was self-administered at a time that was convenient for the pharmacy owner/manager who served as key informant for their respective pharmacy. All questions were written so that they could be answered by one key informant representing their pharmacy without assistance from the researcher. Overall, the questionnaire was divided into four sections as follows:

Section 1: Pharmacy and Pharmacist Characteristics

This section of the questionnaire asked the key informant demographic information about themselves and their pharmacy. This included questions about their sex, education, position at the pharmacy (owner/manager), number of years practicing as a pharmacist, number of years practicing at the current pharmacy, number of employees, and average prescription volume per day. Variables in this section were included in the questionnaire to determine if there was a need to control for their effects.

Section 2: Offering of Quality Improvement-related Initiatives

This section was designed to determine what initiatives were currently being offered at the key informant's practice site. Initiatives that have been shown in the pharmacy literature to

improve quality of care (discussed in Chapter 2) as well as initiatives identified through the qualitative analysis of key informant interviews were listed. These initiatives included automated telephone reminder systems, personal telephone reminder systems, computerized alert systems, blister packaging, Medication Therapy Management, synchronized medication fills, Appointment Based Models (ABMs), and patient education. Key informants were asked to report the initiatives they were currently offering as well as how often they were provided. Additionally, a separate section about the use of EQuIPP was included. This section asked whether the pharmacy had access to the EQuIPP platform and, for those with access, how often and in what way they used it. It also included questions about the features of EQuIPP that they found most useful and/or helpful for their pharmacy and EQuIPP ease of use.

Section 3: Awareness, Knowledge, and Attitudes toward Star Rating Measures

This section asked key informants questions to determine their knowledge and awareness of star ratings and what they mean for pharmacy as well as their attitudes towards star ratings and performance measurement. Both 5 point Likert-type items and true-false items with confidence assessments were utilized.

Section 4: Leadership Style

To determine leadership style, this section used statements from the validated MLQ (5X short) measure of transformational and transactional leadership (Bass & Avolio, 1990). Some questions were necessarily adapted from their validated form to better fit the pharmacy setting based on Phase I interview responses. Key informants were asked to indicate how often they believed the statements provided fit their management style. Response categories ranged from "not at all" to "frequently, if not always."

Questionnaire Variables

The following section describes the variables included in this study in detail. Table 3.1 provides a summary of the variables and operational definitions. A copy of the questionnaire can be found in Appendix F.

Dependent Variables

This study included 3 total dependent variables, depending on the model in question. Because the offering of quality improvement-related initiatives and the use of EQuIPP are both dependent and independent variables depending on the model, these variables are described in the section below regarding independent variables.

Performance data from Pharmacy Quality Solutions and CECity was utilized to calculate the Global Pharmacy Performance Dependent Variable. Upon consultation with Dr. Nau, global pharmacy performance was calculated by first calculating the pharmacy performance on the 5 medication utilization measures. To do this, the first step was to take the number of patients identified in one measure as the numerator and the total number of eligible patients for that measure as the denominator. For example, the diabetes medication adherence measure would take the number of patients at a particular pharmacy that were identified as being adherent to their diabetes medication as the numerator and the total number of patients on diabetes medications at that particular pharmacy as the denominator. This yielded a percentage result for each pharmacy for each measure. If a pharmacy did not have a least 10 patients for a particular measure, they were not eligible to receive score for that measure. Next, pharmacies were ranked by their percentages from high - low for the medication adherence and appropriate diabetes treatment measures (because higher is better) and low - high for the medication safety measure (because lower is better). This was done so that stars could be allocated. The top 20 percent of

pharmacies for each measure received 5 stars, the pharmacies that fell in the 60th - 79th percentile received 4 stars, the pharmacies that fell in 40th - 59th percentile received 3 stars, the pharmacies that fell in the 20th - 39th percentile received 2 stars, and the pharmacies that were in the 19th percentile or below received 1 star.

With star ratings for each pharmacy on the 5 medication utilization-related measures, global pharmacy performance could be calculated. To do this, the sum of the stars for each pharmacy on the star rating measures were divided by the number of star rating measures they were eligible to be evaluated on. For example, if a pharmacy had eligible star ratings for 4 of the 5 star measures, their global score was the sum of their star ratings (e.g., 4.0 + 4.5 + 3.5 + 4.0 = 16) divided by the number of star rating measures they were eligible to be evaluated on based on pharmacy dispensing data (e.g., 16/4 = 4). This ensured pharmacies that were not eligible to receive star ratings on each measure due to their patient population were not penalized. Each pharmacy was given a global performance "star rating" from "0" to "5" based on their global performance.

Table 3.1
List of Variables Included in the Study

Variable	Meaning	Data Source	Operationalization
Dependent Variables			
Global Pharmacy Performance	Pharmacy performance on the medication utilization related measures	EQuIPP data	• Sum of their individual pharmacy star ratings divided by the total number of star ratings they were eligible to receive • Each pharmacy received a global pharmacy performance score from 0 – 5.
Independent Variables			
Awareness	Extent to which key informant is aware of star ratings and current payment trends in healthcare	Questionnaire Q3.1 – 3.3 (3 items)	• Each item is scored ranging from -4 for an incorrect, very confident answer to 4 for a correct, very confident answer • Scale is the sum of 3 items
Knowledge	Extent to which key informant is knowledgeable of star rating specifics	Questionnaire Q3.4 – 3.9 (6 items)	• Each item is scored ranging from -4 for an incorrect, very confident answer to 4 for a correct, very confident answer • Scale is the sum of 6 items
Attitude	Key informant's attitude toward performance measurement and star ratings	Questionnaire Q4.1 – 4.9 (11 items)	• Each item is scored ranging from 0 for "strongly disagree" to 4 for "strongly agree" • One item (Q4.5) is reverse coded • Scale is the sum of 9 items
Offering of Quality Improvement-related initiatives[a]	Participation in quality improvement initiatives	Questionnaire Q2.1 – 2.9 (9 items)	• Each item was scored 0 for "Not offered in the past 12 months" or 1 for "Offered in the past 12 months" • Index is the sum of the 9 items and ranges from 0 – 9.
Use of EQuIPP[a]	Use of the Electronic Quality Improvement Platform for Plans and Pharmacies	Questionnaire Q2.14 (1 item)	• Item was scored 0 for "Does not use EQuIPP" to 1 for "Uses EQuIPP"

Table 3.1 (continued)

Transformational Leadership	Extent to which leader displays the 4 I's of transformational leadership	Questionnaire Q5.2,4-7,9-11, 13-15,17,20, 21,23-27,29 (20 items)	• Each item is scored ranging from 0 for "not at all" to 4 for "Frequently, if not always" • Scale is the mean of 20 items
Idealized Influence	Extent to which employees admire, respect and trust their leader	Questionnaire Q5.4,7,10,13, 15,17,20,27 (8 items)	• Each item is scored ranging from 0 for "not at all" to 4 for "Frequently, if not always" • Scale is the mean of 8 items
Inspiration Motivation	Extent to which leader is enthusiastic, optimistic, and motivates employees	Questionnaire Q5.6,9,21,29 (4 items)	• Each item is scored ranging from 0 for "not at all" to 4 for "Frequently, if not always" • Scale is the mean of 4 items
Intellectual Stimulation	Extent to which leader encourages employees to think outside the box and be creative	Questionnaire Q5.2,5,24,26 (4 items)	• Each item is scored ranging from 0 for "not at all" to 4 for "Frequently, if not always" • Scale is the mean of 4 items
Individual Consideration	Extent to which leader pays attention to each employee's individual needs and acts as a mentor	Questionnaire Q5.11,14,23,25 (4 items)	• Each item is scored ranging from 0 for "not at all" to 4 for "Frequently, if not always" • Scale is the mean of 4 items
Transactional Leadership	Extent to which leader defines expectations and offers rewards for achieving goals while focusing on correcting mistakes	Questionnaire Q5.1,3,8,12, 16,18,22,28 (8 items)	• Each item is scored ranging from 0 for "not at all" to 4 for "Frequently, if not always" • Scale is the mean of 8 items

[a]Variable is both an independent and dependent variable, depending on the model in question.

Independent Variables

This study utilized multiple questions and scales to measure awareness, knowledge, attitudes, the offering of pharmacy quality improvement-related initiatives, the use of EQuIPP, and leadership style.

Awareness

Awareness was defined as the extent to which the respondent was aware of basic information about the star ratings and current payment trends in healthcare. A 3-item scale was developed to measure Awareness. Key informants were asked to indicate whether they believed the following 3 statements were true or false: 1) Medicare Part C and D plans, also known as MA-PDs and PDPs, receive star ratings, 2) the majority of private practice physicians receive a portion of their payment based on their performance, and 3) private health plans are basing a portion of their payment to pharmacies on star rating measure performance. Additionally, for each answer they were asked to indicate how confident they were in their response. This form of confidence-based assessment has been used in medical and biomedical student assessment for a number of reasons (Khan, Davies, & Gupta, 2001). First, a correct answer on a true - false question does not indicate awareness or knowledge because there is no way of knowing if the correct answer was reached by pure guessing or actual awareness/knowledge. Also, it is not possible to understand if an individual incorrectly answered a traditional true-false question because they were not knowledgeable/aware or because they received bad information. In other words, they believe they are answering the question correctly because they were misinformed. Therefore, each incorrect answer was scored from -1 (incorrect, not confident) to -4 (incorrect, very confident) and each correct answer was scored from 1 (correct, not confident) to 4 (correct, very confident). Awareness is the sum of the 3 items in the scale and could range from -12 to 12.

Knowledge

Knowledge was defined in the study as the extent to which the respondent was knowledgeable about Medicare Part C and D plan ratings and their importance to plans and providers. A 6-item scale was developed to measure Knowledge. Key informants were asked to indicate whether they believed the following 6 statements were true or false: 1) patients can access information on any Medicare Part D plan to see the plan's star rating, 2) a plan that receives a 5 star rating can enroll patients at any time during the year, 3) quality bonus payments are paid to plans that perform at a 4 star or higher level, 4) plans that perform at a 3 star level or lower for 3 consecutive years are no longer able to enroll patients through the Medicare website, 5) medication related measures account for approximately 50% of the overall Medicare Part D star rating, and 6) less than 40% of Medicare Part D contract for 2014 perform at the 4 stars or higher level. Similar to the awareness questions, the respondent was asked to indicate their level of confidence in their response. Each incorrect answer was scored from -1 (incorrect, not confident) to -4 (incorrect, very confident) and each correct answer was scored from 1 (correct, not confident) to 4 (correct, very confident). Knowledge is the sum of the 6 items in the scale and could range from -24 to 24.

Attitudes

Attitudes toward star ratings were defined as the overall attitude of the key informant toward performance measurement and star ratings in healthcare with a specific emphasis on community pharmacy. Key informants were asked to indicate their level of agreement with the following 11 statements, some of which were adapted from previous work by Meterko and colleagues (2006) on provider attitudes towards pay-for-performance programs: 1) the star rating performance measures are tied to meaningful patient outcomes, 2) reaching the thresholds set by

CMS for the performance measures is good for my patients, 3) I have adequate information about how the star ratings are computed, 4) I would not mind having some of my pharmacy's reimbursement tied to our performance, 5) the effort required to achieve high performance on the star rating measures will have a negative impact on other areas of my practice, 6) pharmacies are on a level playing field for achieving high ratings, 7) the actions necessary to achieve high ratings are largely within my control, 8) the methods and data used to evaluate my pharmacy's performance are accurate, 9) I believe pharmacists should be responsible for ensuring patients are adherent to their medications, 10) I believe pharmacists should attempt to switch elderly patients from high-risk medications, and 11) I believe pharmacists should attempt to get an ACE inhibitor or ARB prescribed for their patients with diabetes and hypertension who are not taking anything for their hypertension. Each item was scored on a Likert-type scale from 0 "strongly disagree" to 4 "strongly agree". One item (number 5 above) was reverse scored because of its negative wording. Mean scores were calculated for the 11 items in the scale so that the scores on this measure ranged from 0 to 4.

Offering of Quality Improvement-related Initiatives

The offering of quality improvement-related initiatives was defined as the number of initiatives that have the potential to improve quality in community pharmacies that have been offered in the pharmacy in the past 12 months. Based on the review of the literature and the information gained from the qualitative interviews in phase I, a list of quality improvement initiatives was compiled. Respondents were asked to indicate whether they offered: 1) automated telephone reminders to refill prescriptions, 2) personal telephone reminders to refill prescriptions, 3) Medication Therapy Management, 4) educational pamphlets or handouts, 5) synchronized medication fills, 6) blister/bubble packaging, 7) appointment based models

(ABMs), 8) group educational meetings for patients with similar conditions, or 9) computerized warning systems to avoid drug-drug interactions or high risk medications. Each item was scored as a 0 for "did not offer in the past 12 months" or a 1 "offered in the past 12 months." The index was the sum of the 9 items and ranged from 0 – 9.

Use of EQuIPP

Implementation and use of the EQuIPP platform was also of interest for this study. Respondents were asked to indicate whether their pharmacy had access to the EQuIPP platform and, if so, how they used EQuIPP. Questions covered 1) the date gained access to EQuIPP, 2) changes made to improve pharmacy performance since gaining access, 3) frequency of use (weekly, monthly, every other month, etc.), 4) benchmarking practices (against ourselves, against others in our area, against state averages, etc.), and 5) what EQuIPP's most helpful features were to the user. Additionally, 5 questions were adapted from technology acceptance questionnaires to get a better understanding of ease of use and usefulness of EQuIPP. For analysis purposes, use of EQuIPP was condensed to a binary variable. Pharmacies received a 0 for "no use of EQuIPP" or a 1 for "Use of EQuIPP."

Transformational Leadership

Transformational leadership was defined as the extent to which the leader in the pharmacy believed they displayed the 4 I's of transformational leadership (Bass & Avolio, 1990). Key informants were asked to indicate how well the 20 items representing the 4 I's of transformational leadership fit them as a pharmacy owner/manager. Each items was scored ranging from 0 "not at all" to 4 "frequently, if not always". Mean scores for the 20 items were calculated so that the overall score ranged from 0 to 4. The 4 I's of transformational leadership and their respective scale items are explained in further detail in the following sections.

Idealized influence. Idealized influence was defined as the extent to which the leader felt their employees admire, respect, and trust them. Key informants were asked to indicate how well the following 8 items from the MLQ (5Xshort) (Bass & Avolio, 1990) fit with them as a pharmacy manager/owner: 1) I talk about my most important values and beliefs, 2) I instill pride in others for being associated with me, 3) I specify the importance of having a strong sense of purpose, 4) I go beyond self-interest for the good of the group, 5) I act in ways that build others' respect for me, 6) I consider the moral and ethical consequences of decisions, 7) I display a sense of power and confidence, and 8) I emphasize the importance of having a collective sense of mission. Each of these items was scored ranging from 0 "not at all" to 4 "frequently, if not always". Mean scores for the 8 items were calculated so that the overall score ranged from 0 to 4.

Inspiration motivation. Inspiration motivation was defined for this study as the extent to which the leader feels they are enthusiastic, optimistic, and motivating to employees in their pharmacy. Key informants were asked to indicate how well the following 4 items from the MLQ (5Xshort) (Bass & Avolio, 1990) fit with them as a pharmacy manager/owner: 1) I talk optimistically about the future, 2) I talk enthusiastically about what needs to be accomplished, 3) I articulate a compelling vision of the future, and 4) I express confidence that goals will be achieved. Each of these items was scored ranging from 0 "not at all" to 4 "frequently, if not always". Mean scores for the 4 items were calculated so that the overall score ranged from 0 to 4.

Intellectual stimulation. Intellectual stimulation was defined as the extent to which the leader encouraged their employees to think outside the box and be creative when coming up with solutions to problems. Key informants were asked to indicate how well the following 4 items from the MLQ (5Xshort) (Bass & Avolio, 1990) fit with them as a pharmacy manager/owner: 1) I re-examine critical assumptions to question whether they are appropriate, 2) I seek differing

perspectives when solving problems, 3) I get others to look at problems from many different angles, and 4) I suggest new ways of looking at how to complete assignments. Each of these items was scored ranging from 0 “not at all” to 4 “frequently, if not always”. Mean scores for the 4 items were calculated so that the overall score ranged from 0 to 4.

Individual consideration. Individual consideration was defined as the extent to which the leader paid attention to each employee’s individual needs, treated the employees as individuals and not just members of the group, and acted as a coach or mentor. Key informants were asked to indicate how well the following 4 items from the MLQ (5Xshort) (Bass & Avolio, 1990) fit with them as a pharmacy manager/owner: 1) I treat employees as individuals rather than just members of the group, 2) I spend time teaching and coaching, 3) I consider an individual as having different needs, abilities, and aspirations from others, and 4) I help others to develop their strengths. Each of these items was scored ranging from 0 “not at all” to 4 “frequently, if not always”. Mean scores for the 4 items were calculated so that the overall score ranged from 0 to 4.

Transactional Leadership

Transactional leadership was defined as the extent to which a leader made distinct expectations and offered rewards for achieving goals while focusing on mistakes and correcting them. Key informants were asked to indicate how well the following 8 items from the MLQ (5Xshort) (Bass & Avolio, 1990) fit with them as a pharmacy manager/owner: 1) I provide my employees with assistance in exchange for their efforts, 2) I focus attention on irregularities, mistakes, exceptions, and deviations from standards, 3) I discuss in specific terms who is responsible for achieving performance targets, 4) I make clear what one can expect to receive when performance goals are achieved, 5) I concentrate my full attention on dealing with

mistakes, complaints, and failures, 6) I keep track of all mistakes, 7) I direct my attention toward failures to meet my standards, and 8) I express satisfaction when others meet expectations. Each of these items was scored ranging from 0 “not at all” to 4 “frequently, if not always”. Mean scores for the 4 items were calculated so that the overall score ranged from 0 to 4.

Pretest of Questionnaire

Prior to widespread distribution, a convenience sample of 4 pharmacists in Alabama were selected to pretest the questionnaire. Cognitive interviewing, sometimes called think-aloud interviewing, is a commonly used method to pretest questionnaires and was utilized for this study (Dillman, 2000; Drennan, 2003). The overall goal of cognitive interviewing was to gain a better understanding of how responding pharmacists interpreted questions and to identify potential problems with specific questions. Using the cognitive interviewing method, literature shows that researchers are able to understand human information processing which includes attention span, word recognition, memory, language processing, problem solving, and reasoning in relation to completing questionnaires (Dillman, 2000; Drennan, 2003). For this study, the principal investigator asked pretest participants to think out loud as they read through the questionnaire and to verbalize everything they were thinking. The principal investigator also asked probing questions to find out more information about specific questions. For example, when the researcher noticed a participant struggling with a particular question, they asked the participant to repeat the question in their own words. The principal investigator took note of questions in which the participant changed their answer and questions that the participant spent more time than expected thinking about before answering. Upon completion of the cognitive interviews with participants, all issues that arose in the questionnaire were addressed and the final version of the questionnaire was created.

Performance Data

Pharmacy performance data was acquired from Pharmacy Quality Solutions and CECity through the EQuIPP Platform. To access this data, the principal investigator shared the pharmacy code list with an information technology specialist at CECity in Pittsburgh, Pennsylvania. This individual integrated the code list into the master data file for all Alabama pharmacies and then destroyed said list. As participants returned their signed informed consents and completed questionnaires, the code numbers for these participants was shared with the individual at CECity which allowed him to pull the performance data for these pharmacies by querying their code number. This data was shared via an encrypted and password protected file sent from CECity to the principal investigator. Performance scores for all pharmacies that participated and returned a signed informed consent form with their completed questionnaire was obtained.

Data Analyses

SPSS version 23.0 was used to conduct all statistical analyses. Data from the questionnaires was manually entered and double-checked by the principal investigator. Upon receipt of the secondary data from Pharmacy Quality Solutions and CECity, the principal investigator used the code number to match the questionnaire data to the performance data that was also entered manually into SPSS version 23.0 for analysis.

Non-response Bias Investigation

To ensure non-response bias did not negatively impact the validity of the results of the study, determination if any non-response bias is present was necessary. To do this, a commonly utilized method known as wave analysis was used to investigate non-response bias. Utilizing this

method, the first 20% of responders (early responders) was compared to the last 20% of responders (late responders) to assess non-response bias (Armstrong & Overton, 1977).

Validity

Validity can be defined as how well an instrument measures what it sets out to measure. Three types of validity were assessed in this study: 1) content validity, 2) construct validity, and 3) discriminant validity. To assess content validity, during the development of the questionnaire the principal investigator's graduate advisor was asked to review the content to ensure that it contained everything that needed to be present and did not include anything that it shouldn't. Construct validity is how well ideas or theories were translated into the operationalization of constructs. To ensure construct validity, clear definitions of each measure are shown in Table 3.1. Discriminant validity is used to test whether measures that are not supposed to be related are, in fact, not related. Exploratory factor analysis was used to assess discriminant validity.

Reliability

In general, reliability is the consistency of items that are meant to measure a specific construct actually measuring that specific construct. Cronbach's alpha is a widely used measure of reliability and was used to measure internal consistency among groups of items combined to measure a specific construct. A Cronbach's alpha of 0.7 was set as a minimum cut off for acceptable reliability of multi-item measures.

Descriptive Statistics

Descriptive statistics (means, standard deviations, frequencies) were calculated and reported for all key variables. Specifically, demographic characteristics of participants and pharmacies were calculated as well as descriptive statistics for all independent variables.

Bivariate Analysis

Bivariate relationships between variables were tested using correlations to identify significant ($p<0.05$) associations between variables. Specifically, correlations between demographic characteristics and the dependent variables to identify potential control variables were investigated. Next, correlations among the independent variables were investigated to identify potential problems with multicollinearity.

Multivariate analysis

Hierarchical linear regression and hierarchical binary logistic regression analyses were conducted to examine the relationship between independent and dependent variables. Statistically significant relationships were found when a p-value was less than 0.05.

Chapter 4. Results

Phase I: Qualitative Phase

Phase I of this dissertation research utilized key informant interviews to gain a greater understanding of the current awareness, knowledge, and attitudes toward the CMS star rating system as well as the initiatives that are currently being conducted in community pharmacies that pharmacy owners associate with quality care. A list of 15 top performing pharmacies in Alabama was obtained from EQuIPP and CECity. These pharmacies were identified as top performers based on their scores on the star rating measures. Interviews were conducted using open-ended questions with pharmacy owners of independently-owned community pharmacies between December 2014 and February 2015. Of the 15 pharmacies contacted, a total of 10 pharmacy owners agreed to participate in a telephone interview. No additional pharmacies were requested from EQuIPP and CECity because the saturation point was reached after the tenth interview was conducted. The length of time per interview ranged from 24 to 43 minutes. All interviews were transcribed verbatim which resulted in 29,374 words or 117.5 pages of text at 250 words per page.

Two researchers trained in the use of ATLAS.ti independently coded the dataset to identify themes. The process of coding the data is explained in the following sentences. First, the two researchers read over a portion of the data and noted thoughts and ideas for codes. Next, each researcher open-coded approximately half of the dataset to generate initial codes. The researchers then met to review their coding schemes and discuss any discrepancies between the

excerpts that they coded. This allowed the coders to finalize an agreed upon code list to use to code the full dataset. Lastly, both coders independently coded the full dataset with the agreed upon code list so that inter-coder reliability could be calculated. Coder A compiled a total of 524 codes while coder B coded 498.

Themes

Analysis of the interview data led to the identification of 4 themes among high-performing pharmacy owners. Example excerpts from interviews with pharmacy owners that demonstrate these themes are found in Table 4.1 and throughout this section of the dissertation. Inter-coder reliability was good overall (Krippendorf's α =0.793) and for each theme individually (Krippendrof's α ranged from 0.742 to 0.869). These 4 themes fall into the following 4 categories: 1) Awareness, 2) Attitudes, 3) Relationships, and 4) Technology.

Awareness

Awareness of the star rating system was coded 96 times by coder A and 93 times by coder B. Interview questions were asked to get a better understanding of high-performing pharmacy owners' awareness and knowledge related to the star rating measures. Specifically, questions about the measures associated with high-risk medication use in the elderly, appropriate diabetes treatment, and adherence to medications for chronic diseases were of interest because of their ability to be directly impacted by pharmacist intervention. Overall, pharmacy owners of well performing pharmacies stated that they were aware of the measures. Although they knew the measures were in existence, many of the pharmacy owners did not have extensive knowledge of how these measures were calculated. For example, one pharmacy owner stated, *"I don't have a real deep understanding of the star ratings other than that there are certain people on certain medications and we are being evaluated on how they are taking their medications, do they have*

the right medications, and those kinds of things that might fly under the radar." Another pharmacy owner explained, "*I know that we get these notifications from our software that are about the star ratings but I am not sure exactly how the stars are calculated. I guess it is the percentage of my patients that are getting good treatment based on the measures*."

Table 4.1
Excerpts from Interviews Demonstrating Themes

Theme	Excerpt from interviews
Awareness	*"I know the ratings are out there and there are some people who are using them but that's about it."* *"I think if there were more benefits to my pharmacy for knowing more about the ratings, I would look more into it."*
Attitudes	*"I think they're (the measures) a good thing. I think anything that can help us to identify our underserved patients is a good thing."* *"I like the idea in theory. It sounds good. I just don't know how we are ever going to see anything as a result of our investment."*
Relationships	*"The best thing that we do here is that we care about our patients. All the other stuff we do is part of it, but we really care about how our patients are doing and doing whatever we can to help them feel as good as they can."* *"Everyone here works together. I don't think that there is any one person that works here that doesn't know what's going on and why we are doing what we are doing."*
Technology	*"Our computer system can tell us all kinds of things. I use it all the time to look at medications our patients are taking and to see if I can save them any money or get them on something that might work better for them."* *"I use EQuIPP to look at the star ratings but we don't focus on it too much. We use our computer system every day to alert us and I know we are doing the best we can because I always check it."*

A second area that was targeted to gauge awareness was the current changes in Alabama in relation to the star ratings. For example, one Medicare plan was offering a percentage of reimbursements as a "bonus" to the pharmacies that performed at a high level. When pharmacy owners were asked about their awareness of this plan, many said that they did not know about the bonus opportunity. One pharmacy owner stated, "*I didn't know about that. That would be huge. If they'll pay for us to do the work, we'll definitely do it. And I think they should pay us.*" Another owner answered, "*I don't think I have heard anything about that but I would like to know more about it.*" Other pharmacy owners stated having heard about the bonus payment from the insurance company but when asked what they knew about the payment, they could not provide details.

Attitudes

Attitude towards the star rating system was coded 79 times by coder A and 77 times by coder B. This theme was most frequently apparent when questions were asked that were aimed at understanding how pharmacy owners perceived the star ratings, whether or not they felt the star ratings accurately measured their performance, and their thoughts about the possibility of having performance linked to the payment they receive for the services they provide. Overall, many owners felt positive about the star rating system because of the potential impact it could have on the health and outcomes of their patients but somewhat uncertain about unintended or indirect effects on patient care. Additionally, some owners seemed wary about who would ultimately benefit from the program.

Although they did not have a complete understanding of the measures, they felt that monitoring their performance in an effort to improve patient care was appropriate and could

encourage interaction with patients. For example, one owner stated, "*I think it's a good thing. We pharmacists should all be monitoring this stuff for our patients anyhow. I think it might make some of those that don't start paying attention more and talking to their patients more.*" Another pharmacy owner stated, "*I think it's a good start and they are pretty good at what they are doing. There might be some other measures out there that would be able to determine adherence and those kinds of things better than the ones they are using but I don't know of any.*"

Although the bulk of the owners interviewed felt the measures were a good thing, some were still nervous about the way they might be used in the future. One owner explained, "*If they start using these measures and start making it so that we can't fill prescriptions for some patients because the insurance companies won't make a deal with us anymore, that's really doing a disservice to the patient.*" Another owner stated, "*I worry that some pharmacies will be so worried about their stars that they will look up patients that aren't coming in when they are supposed to to refill their prescriptions and they will cut them loose…You know, kind of cherry pick the patients that help them get the good stars and deny prescriptions to the others.*" Owners also were skeptical about being paid by the insurance companies for improving their star ratings. One owner said, "*I just don't think I will see any money from it. It really isn't a fair thing. I have to spend all this money on new software and training and then the insurance companies are the ones that profit off it.*" Another pharmacy owner joked, "*We're the idiots and I'm idiot number one because we're (pharmacies) spending the money to get the star ratings up and all I'm doing is helping the insurance company.*"

Relationships

Relationships with patients and staff was the third theme that was apparent from the interviews with pharmacy owners. This theme was coded 83 times by coder A and 80 times by

coder B. Pharmacy owners put emphasis on the importance of personal relationships with both their patients and their employees. When asked why they believed they were performing at a high level, many owners stated that the relationships they have with their patients make all the difference. For example, one pharmacy owner stated, "*I really don't think we are doing anything different from what other pharmacies out there are doing but I do think we value our patients and let them know that we want them to be healthy. We've been around a long time and we see our patients around town and we're friends with them. We talk to them when they come in the store and we know them by name.*" Another owner explained, "*When your patients know that you really care about them, they are more willing to listen to what you have to say. Our patients trust us because we take the time to talk to them about their drugs and always try to do what's in the best interest of our patients.*"

Pharmacy owners also described the relationship they have with their employees as being a reason they believe they perform well. One owner said, "*We all get on board behind these kinds of things. We have staff meetings and we talk about why we are doing this or that and we are on the same page. From the pharmacists to the technicians to the clerks. You have to involve everyone because, you know, the clerks will start selling it out front to customers that come in and the techs can help with the process and the pharmacists can kind of oversee everything and make sure it goes smooth.*" He continued, "*We don't have secrets here and we put it all out on the table for our staff. We make sure everyone is included in the things we do.*" Another owner explained, "*When we make a decision to change something we do, we bring everyone together and talk about it first. I might still have to make a decision that not everyone agrees with but I still want them to hear the reasons we are doing what we do before we do it.*" Overall, the pharmacy owners echoed this sentiment but there were a few owners who seemed to like to

control the decision-making process a little more. For example, one owner stated, "*You have to have a combination of delegating roles and working as a team. I want to make sure everyone knows why we are getting a new software or something but when it comes to who will be responsible for learning it and using it, I delegate that to someone. After that, I usually monitor them myself. I want someone to do it but I am definitely the overseer.*"

Technology

The final overarching theme, technology, was coded 72 times by coder A and 73 times by coder B. When pharmacy owners were asked about services they provided to their customers that they believe may have helped result in high performance scores on the star rating measures, the majority mentioned their technology, specifically their computer systems and software they use to provide medication therapy management and reminder calls to patients. Specifically, a program called Prescribe Wellness was repeatedly mentioned as computer software that was helpful for the identification of patients who were late to pick-up refills. Additionally, the Prescribe Wellness software allowed for many of the pharmacies that were interviewed to implement medication synchronization for their patients on multiple chronic medications. For example, one owner stated, "*When a patient is about 3 days away from getting their prescriptions, the Prescribe Wellness automatically calls them and if the patient gets the call and they have a question, they can push a button on the phone and it will dial directly to the pharmacy so they can talk to one of us. It also calls once they are late to pick up the prescription. I think it helps.*" Another pharmacy owner explained, "*I really think our Prescribe Wellness program really has an unlimited amount of things you can do with it… It's just a matter of your imagination. It integrated with our pharmacy system and can pick out just about any demographic you want and call them. You know, all diabetic patients, heart patients, patients on*

a specific medication, and so forth." Another pharmacy owner explained some of the things they were doing with Prescribe Wellness: "*One of our new things that we're going to be doing through Prescribe Wellness is picking out diabetic patients that are not on hypertension medications and make sure we get them on all the right medications and stuff… That's probably going to be implemented the mid part of this year.*"

When asked specifically about EQuIPP, all pharmacy owners had heard of the platform but few used it regularly. One pharmacy owner stated, "*We have EQuIPP which we can look at but that is only a limited number of prescriptions that are in that system.… not all plans are signed up to that so only the prescriptions filled by the plans that are signed up for EQuIPP will show and it only affects us to about... at last check it was about 4 or 5 plans. They're big plans but only about 4 or 5.*" Another pharmacy owner described how they use the system: "*Every month or so we print out our star ratings from EQuIPP and we post them in the office so that everyone that goes in there, you know, the pharmacists and techs, they can see how we are doing. We also talk about the ratings in staff meetings after we print them out but I wouldn't say we use the system weekly or anything.*" Overall, the majority of the pharmacies that were interviewed had been exposed to the EQuIPP platform but not all owners used the platform's many features.

Phase II: Quantitative Phase

Phase II of the dissertation utilized a cross-sectional study design with data collected from 2 sources: 1) a self-administered questionnaire and 2) pharmacy performance data from EQuIPP. This section describes the data collection results including the response rate and the results from analyses. First, the study response rate is explained. Second, the characteristics of the respondents and their pharmacies are described. Third, the investigation into non-response

bias is provided. Fourth, awareness, knowledge and attitudes of providers as well as the offering of quality improvement-related initiatives in community pharmacies are described. Fifth, scales are analyzed for validity and reliability. Sixth, the types of leadership in community pharmacies measured by the MLQ (5Xshort), a validated measure of organizational leadership, are described. Finally, the hypotheses of the study are evaluated using multiple regression and the results of these evaluations are presented.

Response Rate

As previously described in Chapter 3, a modified Dillman method was utilized to collect data from respondents. A 6-page questionnaire was mailed via USPS first class mail to 350 randomly selected independently-owned community pharmacies in Alabama. Responding pharmacy owners were instructed to complete and return both the questionnaire and the informed consent form if they were interested in participating. Of the 350 mailed questionnaires, 12 were undeliverable as addressed and were returned to sender. Of the 338 questionnaires presumed to be deliverable, a total of 90 responses were returned yielding an overall response rate of 26.6%. All 90 responses were complete (i.e., they included both signed informed-consent and completed questionnaire).

Descriptive Statistics

Description of Respondent Pharmacy Owners/Managers and Their Pharmacies

Characteristics of pharmacy respondents are displayed in Table 4.2. The majority of the respondents were Male (66.7%), held a Bachelor of Science in Pharmacy degree (59.0%), and were owners of their pharmacies (52.1%). On average, respondents reported practicing as a pharmacist for more than 20 years (mean=24.1; SD=14.5), had been practicing at their current site more than 10 years (mean=14.1; SD=12.7), had been a pharmacy manager or owner for

more than 15 years (mean=16.2; SD=13.6), and have an average of 12.1 (SD=12.9) years as a manager or owner at their current practice site.

Table 4.2
Characteristics of Respondents (N=90)[a]

Categorical Variables	N (%)
Sex	
Male	60 (66.7)
Female	30 (33.3)
Education	
BS Pharmacy	59 (59.0)
PharmD	33 (33.0)
Residency	2 (2.0)
Masters	3 (3.0)
Other	3 (3.0)
Job title	
Pharmacy Manager	54 (43.5)
Owner/partner	65 (52.1)
Other	5 (4.4)
Continuous Variables	**Mean (SD)**
Number of years practicing as a pharmacist	24.1 (14.5)
Number of years practicing at current site	14.1 (12.7)
Number of years as a pharmacy manager/owner	16.2 (13.6)
Number of years as a pharmacy manager/owner at current site	12.1 (12.9)

[a]Respondents were allowed to indicate more than one response for Education and Job Title variables.

Participating pharmacy characteristics are displayed in Table 4.3. The majority of the pharmacies (54.4%) reported having access to the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP). Among participating pharmacies, the average volume of prescriptions per day was approximately 250, the average number of hours the pharmacies were open per week was a little more than 55, the pharmacies had an average of 46.3% of their population over the age of 65, and they employed an average of 4.4 Full Time Equivalent (FTE) technicians and 2.0 FTE staff pharmacists.

Table 4.3
Pharmacy Characteristics[a]

Categorical Variables	N	(%)
Does pharmacy have access to the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP)?		
Yes	49	(54.4)
No	41	(45.6)
Continuous Variables	**Mean**	**(SD)**
Average prescription volume per day	247.72	(126.13)
Number of hours per week the pharmacy is open	55.28	(9.37)
Approximate percentage of patient over 65 years of age	46.26	(16.37)
Total number of employees manager/owner is responsible for	9.80	(7.02)
Number of technicians employed	4.37	(3.71)
Number of staff pharmacists employed	2.03	(1.59)

[a]N=90

Non-response Bias Investigation

To investigate non-response bias, several characteristics of the first 20 percent of study respondents and the last 20 percent of study respondents were compared. Both characteristics of the pharmacy owners/managers and their pharmacies were utilized to determine whether any bias was introduced as a result of additional contacts with respondents to encourage study participation. Pearson Chi-Square tests for categorical variables and One-Way ANOVA for continuous variables were used to investigate differences between groups. Findings are summarized in Table 4.4. When comparing earlier and later responders, there were no statistically significant differences between the two groups.

Table 4.4
Characteristics of Early and Late Responders[a]

Categorical Variables	First 20% N (%)	Last 20% N (%)	Chi-Square (df)
Sex			1.029 (1)
Male	12 (66.7)	9 (50.0)	
Female	6 (33.3)	9 (50.0)	
Pharmacy Degree			0.500 (1)
B.S. Pharmacy	13 (72.2)	11 (61.1)	
PharmD	5 (27.8)	7 (38.9)	
Job Position			1.084 (1)
Owner/Partner	13 (72.2)	10 (55.6)	
Manager	5 (27.8)	8 (44.4)	
Does pharmacy have access to EQuIPP?			2.957 (1)
Yes	8 (44.4)	13 (72.2)	
No	10 (55.6)	5 (27.8)	
Continuous Variables	**M (SD)**	**M (SD)**	**F-test value[b]**
Number of years practicing as a pharmacist	25.9 (17.2)	22.2 (13.8)	0.530
Number of years as a pharmacist at the current site	13.7 (15.0)	13.4 (10.5)	0.007
Number of years as a manager/owner	20.4 (16.4)	13.8 (10.7)	2.066
Number of years as a manager/owner at current site	13.1 (15.0)	10.5 (10.7)	0.353

[a]N=18 per group, 36 total.
[b]significant variables (of which there are none) are bold

Awareness and Knowledge

Table 4.5 summarizes respondent awareness and knowledge of star ratings. Participants were given 9 true-false questions to answer and asked to provide their level of confidence in the answer for each question. Regarding awareness, it looks like the majority of pharmacy owners/managers answered the true-false questions correctly but their level of confidence in their answers vary. The largest percentage of respondents (31.1%) knew that Medicare part C and Part D plans receive star ratings but they were only "somewhat confident" in their answer. The largest percent of respondents (25.6%) were also "somewhat confident" in their correct answer that the majority of private practice physicians receive a portion of their payment based on their performance, but 42.2% of respondents answered incorrectly. Finally, the majority of respondents (64.5%) were aware that private health plans are basing a portion of their payment to pharmacies on star rating measure performance.

When investigating pharmacy respondent knowledge, it looks like the majority of pharmacy owners/managers answered the true-false questions correctly, but similar to the awareness questions, there is a lot of variation in their level of confidence in their answers. The majority (86.7%) knew that patients can access information on any Medicare Part D plan to see the plan's star rating and the largest percentage of respondents were confident in their correct answer (31.1%). Alternatively, the majority of respondents (62.2%) did not know that a plan that receives a 5 star rating can enroll patients at any time during the year although the largest percentage of respondents (30.0%) indicated being "not confident" in their incorrect response. The largest percentage of respondents (42.2%) were "somewhat confident" and correct when asked about quality bonus payments being paid to plans who perform at the 4 star level of higher. Also, the largest percentage were "somewhat confident" that plans that perform at a 3 star level

for 3 consecutive years are no longer able to enroll patients through the Medicare website (28.9%), that the medication related measure account for approximately 50% of the overall Medicare Part D plan star rating (31.1%), and that less than 40% of Medicare Part D contracts for 2014 were 4 stars or higher (38.9%).

Table 4.5
Awareness and Knowledge of Star Ratings (N=90)[a]

Variable	Confidence in Response and Whether Response was Correct or Incorrect							
	Answered Incorrectly				Answered Correctly			
	Very Confident		Somewhat	Not	Not	Somewhat	Confident	Very
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Awareness								
Medicare Part C and D plans, also known as MA-PDs and PDPs, receive star ratings.	1 (1.1)	0 (0.0)	3 (3.3)	6 (6.7)	4 (4.4)	**28 (31.1)**	22 (24.4)	26 (28.9)
The majority of private practice physicians receive a portion of their payment based on performance.	0 (0.0)	9 (10.0)	20 (22.2)	9 (10.0)	6 (6.7)	**23 (25.6)**	18 (20.0)	5 (5.6)
Private health plans are basing a portion of their payment to pharmacies on star rating measure performance	3 (3.3)	8 (8.9)	14 (15.6)	7 (7.8)	5 (5.6)	**25 (27.8)**	19 (21.1)	9 (10.0)
Knowledge								
Patients can access information on any Medicare Part D plan to see the plan's star rating.	1 (1.1)	1 (1.1)	5 (5.6)	6 (5.6)	6 (6.7)	27 (30.0)	**28 (31.1)**	17 (18.9)
A plan that receives a 5 star rating can enroll patients at any time during the year.	3 (3.3)	7 (7.8)	19 (21.1)	**27 (30.0)**	10 (11.1)	11 (12.2)	6 (6.7)	7 (7.8)
Quality bonus payments are paid to plans that perform at a 4 star level or higher.	0 (0.0)	1 (1.1)	4 (4.4)	12 (13.3)	10 (11.1)	**38 (42.2)**	17 (18.9)	8 8.9)
Plans that perform at a 3 star level or lower for 3 consecutive years are no longer able to enroll patients through the Medicare website.	0 (0.0)	3 (3.3)	14 (15.6)	22 (24.4)	14 (15.6)	**26 (28.9)**	9 (10.0)	2 (2.2)
Medication related measures account for approximately 50% of the overall Medicare Part D plan star rating.	1 (1.1)	2 (2.2)	9 (10.0)	14 (15.6)	16 (17.8)	**28 (31.1)**	12 (13.3)	8 (8.9)
Less than 40% of Medicare Part D contracts for 2014 are 4 stars or higher.	0 (0.0)	3 (3.3)	10 (11.1)	13 (14.4)	16 (17.8)	**35 (38.9)**	9 (10.0)	4 (4.4)

[a]Highest % for each row is bold.

Attitude toward Star Ratings

Respondents were asked for their thoughts about the star rating measures and how they are being utilized. Descriptive findings are summarized in Table 4.6. Interestingly, the largest percentage of respondents only indicated a neutral stance on one statement. Specifically, 44.4% of respondents neither agreed or disagreed with the statement, "The methods and data used to evaluate my pharmacy's performance are accurate." When expressing negative attitudes toward the star ratings, the largest percentage of respondents disagreed with the statement, "I have adequate information about how the star rating are computed" (30.0%), disagreed with the statement, "Pharmacies are on a level playing field for achieving high ratings" (43.3%), and disagreed with the statement, "the actions necessary to achieve high ratings are largely within my control" (34.4%). Additionally, the majority of respondents (33.3%) agreed with one negatively phrased statement, "The effort required to achieve high performance on the star rating measures will have a negative impact on other areas of my practice."

Alternatively, positive attitudes toward star ratings were expressed with the largest percentage of respondents agreeing with the statement, "The star ratings are tied to meaningful patient outcomes" (52.2%), agreeing with the statement, "Reaching thresholds set by CMS for the performance measures is good for my patients" (53.3%), and agreeing with the statement, "I would not mind having some of my pharmacy's reimbursement tied to our performance" (34.4%). Lastly, the final 3 questions were focused on the belief that the pharmacist is somewhat responsible for improving star ratings and the largest percent of respondents agree with all 3: 1) "I believe pharmacists should be responsible for ensuring patients are adherent to their medications" (37.8%), 2) "I believe pharmacists should attempt to switch elderly patients from high-risk medications" (40.0%), and 3) "I believe pharmacists should attempt to get an ACE

Table 4.6
Pharmacy Owner and Manager Attitude toward Star Ratings (N=90)[a]

Pharmacy Owners' and Managers' Attitudes toward statements related to the star ratings and what they mean for pharmacy practice.	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
	N (%)	N (%)	N (%)	N (%)	N (%)
The star rating performance measures are tied to meaningful patient outcomes.	6 (6.7)	16 (17.8)	12 (13.3)	**47 (52.2)**	9 (10.0)
Reaching the thresholds set by CMS for the performance measures is good for my patients.	1 (1.1)	12 (13.3)	19 (21.1)	**48 (53.3)**	10 (11.1)
I have adequate information about how the star ratings are computed.	12 (13.3)	**27 (30.0)**	20 (22.2)	22 (24.4)	9 (10.0)
I would not mind having some of my pharmacy's reimbursement tied to our performance.	12 (13.3)	21 (23.3)	14 (15.6)	**31 (34.4)**	12 (13.3)
The effort required to achieve high performance on the star rating measures will have a negative impact on other areas of my practice.	6 (6.7)	22 (24.4)	24 (26.7)	**30 (33.3)**	8 (8.9)
Pharmacies are on a level playing field for achieving high ratings.	22 (24.4)	**39 (43.3)**	9 (10.0)	17 (18.9)	3 (3.3)
The actions necessary to achieve high ratings are largely within my control.	11 (12.2)	**31 (34.4)**	18 (20.0)	24 (26.7)	6 (6.7)
The methods and data used to evaluate my pharmacy's performance are accurate.	4 (4.4)	26 (28.9)	**40 (44.4)**	18 (20.0)	2 (2.2)
I believe pharmacists should be responsible for ensuring patients are adherent to their medications.	11 (12.2)	20 (22.2)	18 (20.0)	**34 (37.8)**	7 (7.8)
I believe pharmacists should attempt to switch elderly patients from high-risk medications.	3 (3.3)	12 (13.3)	24 (26.7)	**36 (40.0)**	15 (16.7)
I believe pharmacists should attempt to get an ACE inhibitor or ARB prescribed for their patients with diabetes and hypertension who are not taking anything for their hypertension.	1 (1.1)	13 (14.4)	20 (22.2)	**47 (52.2)**	9 (10.0)

[a]Highest % for each row is bold.

inhibitor or ARB prescribed for their patients with diabetes and hypertension who are not taking anything for their hypertension" (52.2%).

Offering of Quality Improvement-related Initiatives

Table 4.7 summarizes the quality improvement-related initiatives offered in respondent community pharmacies during the past 12 months. The majority of pharmacies provided Medication Therapy Management (94.4%), educational pamphlets or printouts (90.0%), blister or bubble packaging (60.0%), and synchronized medication fills (51.1%). On the other hand, less than half of the respondent pharmacies were providing automated telephone reminders to refill prescriptions (44.4%), personal telephone reminders to refill prescriptions (37.8%), Appointment Based Models (13.3%) and group educational meeting for patients with similar conditions (8.9%). Nearly all respondents (96.7%) had a computerized warning system to avoid drug-drug interactions or the dispensing of high-risk medications.

Table 4.7
Services Offered in Independently-owned Community Pharmacies (N=90)[a]

Service	Offered in the past 12 months N (%)	Not offered in the past 12 months N (%)
Computerized warning systems to avoid drug-drug interactions or high-risk medications	**87 (96.7)**	3 (3.3)
Medication Therapy Management	**85 (94.4)**	5 (5.6)
Educational pamphlets or printouts	**81 (90.0)**	9 (10.0)
Blister/bubble packaging	**54 (60.0)**	36 (40.0)
The Electronic Quality Improvement Plan for Plans and Pharmacies (EQuIPP)	**49 (54.4)**	41 (45.6)
Synchronized medication fills	**46 (51.1)**	44 (48.9)
Automated telephone reminders to refill prescriptions	40 (44.4)	**50 (55.6)**
Personal telephone reminders to refill prescriptions	34 (37.8)	**56 (62.2)**
Appointment Based Models (ABMs)	12 (13.3)	**78 (86.7)**
Group educational meetings for patients with similar conditions	8 (8.9)	**82 (91.1)**

[a]Highest % for each row is bold.

Use of EQuIPP

Table 4.8 describes in further detail the use and ease of use of the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP) as reported by respondent pharmacies that had access to EQuIPP. The majority of pharmacies that reported having access to EQuIPP indicated that they have made changes directed at improving pharmacy performance since gaining access to EQuIPP (87.8%) while the greatest percent of pharmacy owners reported checking their performance ratings with EQuIPP once a month (44.9%). The highest percentage of respondents with EQUIPP reported using the platform to benchmark against CMS required levels (53.1%) followed by their own performance (49.0%), state averages (40.8%), national averages (38.8%), and finally other pharmacies in Alabama or their geographic location (32.7% each). When asked what respondents believed to be the most helpful features of EQuIPP, the highest percentage indicated the ability to access pharmacy performance scores on quality measures (65.3%). The least frequently indicated feature found to be helpful was the *Insight Report* that analyzes performance patterns and identifies competitive position (14.3%). Ease of use was also explored and is reported on Table 4.8. Overall, respondents with access to EQuIPP seemed to be satisfied with the platform. Specifically, the majority of respondents with access to EQuIPP agreed with the statement, “I find it easy to get the EQuIPP system to do what I want it to do” (51.0%), as well as “Using EQuIPP does not require a lot of mental effort” (57.1%), “I find EQuIPP easy to use” (55.1%), and “I find EQuIPP to be useful” (57.1%). Nearly half of respondents (49.0%) also agreed with the statement, “Using EQuIPP improves my performance at my job.”

Table 4.8
Use and Ease of Use of the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP) (N=49)[a,b]

Use of EQuIPP	N (%)
Since gaining access to EQuIPP, have you made changes to improve your pharmacy's performance?	
Yes	43 (87.8)
No	6 (12.2)
How often do you (or an employee) check your performance ratings using EQuIPP?	
Once a week	11 (22.4)
Once every 2 weeks	4 (8.2)
Once a month	22 (44.9)
Once every other month	9 (18.4)
Never	3 (6.1)
Which of the following do you benchmark your performance against? [a]	
CMS required levels	26 (53.1)
Yourself	24 (49.0)
State averages	20 (40.8)
National averages	19 (38.8)
Other pharmacies in Alabama	16 (32.7)
Other pharmacies in your geographic location	16 (32.7)
What do you think are the most helpful features of the EQuIPP platform? [a]	
Access to pharmacy performance scores on quality measures	32 (65.3)
Ability to benchmark against pharmacies in your region	23 (46.9)
Ability to benchmark against your pharmacy's past performance	23 (46.9)
Easy-to-understand presentation of pharmacy scores	21 (42.9)
The improvement strategies and resources provided by EQuIPP	9 (18.4)
The *Insight Report* that analyzes performance patterns and identifies competitive position	7 (14.3)

Ease of use of EQuIPP	**Strongly Disagree** N (%)	**Disagree** N (%)	**Neither Agree nor Disagree** N (%)	**Agree** N (%)	**Strongly Agree** N (%)
I find it easy to get the EQuIPP system to do what I want it to do.	3 (6.1)	7 (14.3)	10 (20.4)	**25 (51.0)**	4 (8.2)
Using EQuIPP does not require a lot of mental effort.	3 (6.1)	0 (0.0)	11 (22.4)	**28 (57.1)**	7 (14.3)
I find EQuIPP easy to use.	2 (4.1)	2 (4.1)	10 (20.4)	**27 (55.1)**	8 (16.3)
I find EQuIPP to be useful.	2 (4.1)	4 (8.2)	11 (22.4)	**28 (57.1)**	4 (8.2)
Using EQuIPP improve my performance at my job.	2 (4.1)	8 (16.3)	11 (22.4)	**24 (49.0)**	4 (8.2)

[a]Totals may vary for use of EQuIPP variables because respondents could check multiple responses.
[b]Highest % for each row for ease of use is bold.

Leadership

Respondents were asked to describe their leadership style as they perceive it by checking how frequently statements from the MLQ5X (slightly modified to fit the pharmacy context) fit them as a pharmacy owner/manager. Findings are summarized in Table 4.9. Under the larger "Transformational Leadership" construct, Idealized Influence, Inspiration Motivation, Intellectual Stimulation, and Individual Consideration questions are summarized by question with means and standard deviations provided. Additionally, the mean and standard deviation for Transformational Leadership (3.02, 0.56) and Transactional Leadership (2.75, 0.59) are provided. Under the Transformational Leadership construct, for Idealized Influence, the majority of respondent pharmacy owners/managers (68.9%) indicated that they "Frequently, if not always" consider the more and ethical consequences of decisions. The highest percentage of respondents also answered "fairly often" or "frequently, if not always" to all other Idealized Influence items. Similarly, the highest percentage of respondents also answered "fairly often" or "frequently, if not always" to all Inspiration Motivation items. For Intellectual Stimulation, the highest percentage of respondents answered "fairly often" to all 4 items. Lastly, for Individual Consideration, the majority of respondents (58.9%) answered "frequently, if not always" to the statement, "I treat employees as individuals rather than just members of the group" while the highest percentage of respondents answered "frequently, if not always" or "fairly often" for the remaining 3 questions. Transactional Leadership was made up of 8 questions. Only one statement, "I direct my attention toward failures to meet standards" was answered "sometimes' by the largest percentage of respondents (43.3%). All other questions were answered "fairly often" or "frequently, if not always" by the largest percentage of respondents.

Table 4.9
Leadership Characteristics (N=90)[a]

Variable	Not at all	Once in a while	Sometimes	Fairly often	Frequently if not always	Mean (SD)	Mean (SD)
Transformational Leadership							
Idealized Influence							
I talk about my most important values and beliefs.	0 (0.0)	6 (6.7)	21 (23.3)	**38 (42.2)**	25 (27.8)		
I instill pride in others for being associated with me.	3 (3.3)	5 (5.6)	16 (17.8)	**34 (37.8)**	32 (35.6)		
I specify the importance of having a strong sense of purpose.	2 (2.2)	7 (7.8)	17 (18.9)	**37 (41.1)**	27 (30.0)		
I go beyond self-interest for the good of the group.	0 (0.0)	0 (0.0)	16 (17.8)	**43 (47.8)**	31 (34.4)	3.08	
I act in ways that build others' respect for me.	0 (0.0)	1 (1.1)	11 (12.2)	**39 (43.3)**	**39 (43.3)**	(0.56)	
I consider the moral and ethical consequences of decisions.	0 (0.0)	0 (0.0)	2 (2.2)	26 (28.9)	**62 (68.9)**		
I display a sense of power and confidence.	0 (0.0)	5 (5.6)	20 (22.2)	**42 (46.7)**	23 (25.6)		
I emphasize the importance of having a collective sense of mission.	2 (2.2)	4 (4.4)	22 (24.4)	**38 (42.2)**	24 (26.7)		
Inspiration Motivation							
I express confidence that goals will be achieved.	0 (0.0)	3 (3.3)	15 (16.7)	35 (38.9)	**37 (41.1)**		
I articulate a compelling vision of the future.	3 (3.3)	11 (12.2)	19 (21.1)	**40 (44.4)**	17 (18.9)	2.88	3.02
I talk optimistically about the future.	3 (3.3)	10 (11.1)	21 (23.3)	27 (30.0)	**29 (32.2)**	(0.80)	(0.56)
I talk enthusiastically about what needs to be accomplished.	1 (1.1)	4 (4.4)	21 (23.3)	**39 (43.3)**	25 (27.8)		
Intellectual Stimulation							
I re-examine critical assumptions to question whether they are appropriate.	1 (1.1)	5 (5.6)	25 (27.8)	**42 (46.7)**	17 (18.9)		
I seek differing perspectives when solving problems.	1 (1.1)	4 (4.4)	19 (21.1)	**40 (44.4)**	26 (28.9)	2.86	
I get others to look at problems from many different angles.	0 (0.0)	6 (6.7)	24 (26.7)	**35 (38.9)**	25 (27.8)	(0.69)	
I suggest new ways of looking at how to complete assignments.	0 (0.0)	7 (7.8)	23 (25.6)	**38 (42.2)**	22 (24.4)		
Individual Consideration							
I help others to develop their strengths.	0 (0.0)	4 (4.4)	12 (13.3)	**42 (46.7)**	32 (35.6)		
I consider an individual as having different needs, abilities, and aspirations from others.	0 (0.0)	3 (3.3)	15 (16.7)	32 (35.6)	**40 (44.4)**	3.18	
I treat employees as individuals rather than just members of the group.	0 (0.0)	1 (1.1)	2 (2.2)	34 (37.8)	**53 (58.9)**	(0.58)	
I spend time teaching and coaching.	0 (0.0)	6 (6.7)	22 (24.4)	**43 (47.8)**	19 (21.1)		
Transactional Leadership							
I provide my employees with assistance in exchange for their efforts.	2 (2.2)	6 (6.7)	12 (13.3)	**47 (52.2)**	23 (25.6)		
I discuss in specific terms who is responsible for achieving performance targets.	3 (3.3)	14 (15.6)	27 (30.0)	**28 (31.1)**	18 (20.0)		
I make it clear what one can expect to receive when performance goals are achieved.	3 (3.3)	13 (14.4)	21 (23.3)	**34 (37.8)**	19 (21.1)		
I express satisfaction when others meet expectations.	0 (0.0)	2 (2.2)	9 (10.0)	32 (35.6)	**47 (52.2)**		2.75
I focus my attention on irregularities, mistakes, exceptions, and deviations from standards.	1 (1.1)	7 (7.8)	16 (17.8)	**38 (42.2)**	28 (31.1)		(0.59)
I concentrate my full attention on dealing with mistakes, complaints, and failures.	5 (5.6)	6 (6.7)	19 (21.1)	**32 (35.6)**	28 (31.1)		
I keep track of all mistakes.	3 (3.3)	12 (13.3)	21 (23.3)	**29 (32.2)**	25 (27.8)		
I direct my attention towards failures to meet standards.	5 (5.6)	14 (15.6)	**39 (43.3)**	22 (24.4)	10 (11.1)		

[a]Highest % for each row is bold.

Performance

Performance data was provided for 88 of the 90 respondent pharmacies by Pharmacy Quality Solutions and CECity. Table 4.10 summarizes the performance of pharmacies that participated in the study. Overall, the highest percentage of pharmacies received a global rating of 3.5 stars (25.3%) followed by 3 stars (21.8%) and 2.5 stars (20.7%). No pharmacies received a perfect score of 5 stars and only 1 (1.1%) received 4.5 stars overall. When calculating average pharmacy performance by individual star measure, higher scores on PQA measures 1-4 are associated with better performance while a lower score on PQA measure 5 is associated with better performance. Due to lack of access to pharmacy data for every pharmacy in the state/country and the way stars are allocated for performance (in 20% intervals with lowest 20% of pharmacies receiving 1 star, next lowest 20% receiving 2 stars, etc.), it is unclear whether the respondent pharmacies would receive higher or lower star ratings than other pharmacies. Average performance on the 5 star rating measures for the respondents in this study is provided in Table 4.9.

Table 4.10
Performance on Star Rating Measures of Respondent Pharmacies[a]

Star Rating Measure			Stars		Performance	
	N	(%)	Mean	(SD)	Mean%	(SD)
Global Stars to the Nearest Half Star			2.99	(0.71)		
5.0 Stars	0	(0.0)				
4.5 Stars	1	(1.1)				
4.0 Stars	12	(13.8)				
3.5 Stars	22	(25.3)				
3.0 Stars	19	(21.8)				
2.5 Stars	18	(20.7)				
2.0 Stars	12	(13.8)				
1.5 Stars	3	(3.4)				
1.0 Star	0	(0.0)				
PQA1 – Diabetes Adherence[b]					79.8	(13.3)
PQA2 – Hypertension Adherence[b]					81.7	(12.1)
PQA3 – Hypercholesterolemia Adherence[b]					78.8	(12.2)
PQA4 – Treatment of Hypertension in persons with Diabetes[b]					81.6	(9.4)
PQA5 – Use of High-Risk Medications in the Elderly[c]					6.7	(3.8)

[a]N=87; Some pharmacies did not have an adequate number of patients for each measure and therefore are not included
[b]Higher is better
[c]Lower is better

Description of Multi-Item Measures and Their Components

Reliability and Validity

Prior to conducting bivariate and multivariate analyses, assessment of the relationships between variables and assessment of the multi-item scale for attitude toward star ratings was conducted. A correlation matrix showing the significant relationships between variables for all variables included in the study is found in Appendix G. To assess the reliability of validity of the multi-item scales, a principal components analysis (PCA) was run on the 11 questions designed to measure attitude towards star rating measures. The suitability of PCA was assessed prior to analysis. Inspection of the correlation matrix showed that all variables had at least one correlation coefficient greater than 0.3. The overall Kaiser-Meyer-Olkin (KMO) measure was 0.76 with individual KMO measures all greater than 0.6, classifications of 'mediocre' to 'meritorious' according to Kaiser (1974). Bartlett's Test of Sphericity was statistically significant ($p < .0005$), indicating that the data was likely factorizable.

PCA revealed three components that had eigenvalues greater than one and which explained 34.5%, 14.5%, and 10.7% of the total variance, respectively. Visual inspection of the scree plot indicated that two components should be retained (Cattell, 1966). In addition, a two-component solution met the interpretability criterion. For these reasons, two components were retained.

The two-component solution explained 49.1% of the total variance. A Varimax orthogonal rotation was employed to aid interpretability. The rotated solution exhibited a 'simple structure' (Thurstone, 1947). The interpretation of the two components resulted in defining two different kinds of attitudes toward star ratings: Component 1 had items focused on attitudes toward how the measures are used while Component 2 consisted of the beliefs about the role of the pharmacist in the improvement of star ratings. Component loadings are presented in Appendix H. These 2 components will be referred to as Attitude1 and Attitude2 henceforth. Reliability analysis of

Attitude1 and Attitude2 resulted in acceptable reliability coefficients of 0.78 and 0.73, respectively. Detailed descriptions of multi-item measures are found in Appendix H.

Analytic Results

This section begins with the correlation matrix for independent variables Awareness, Knowledge, Attitude1 and Attitude2 presented in Table 4.11. Correlation between these variables was conducted to determine if there was a potential multicollinearity problem. Next, bivariate relationships between dependent variables, respondent demographics and pharmacy characteristics were examined to determine if any systematic variation should be controlled for in multivariate analyses.

Correlation between Independent Variables included in Multivariate Analyses

Although the correlation matrix (Table 4.11) suggests that AWARENESS and KNOWLEDGE are interrelated ($r=0.21$, $p<0.05$), the association is weak. Additionally, associations between KNOWLEDGE and ATTITUDE1 as well as ATTITUDE1 and ATTITUDE2 are also apparent and weak to moderate ($r=0.34$, $p < 0.01$ and $r=0.35$, $p <0.01$, respectively). The decision was made to include all independent variables in further analyses. More information regarding the examination of multicollinearity can be found in Appendices G and H.

Table 4.11
Correlation Matrix for Variables Employed in Multivariate Models Predicting Pharmacy Offering of Services (n=90)

	AWARENESS	KNOWLEDGE	ATTITUDE1	ATTITUDE2
AWARENESS				
KNOWLEGE	.21*			
ATTITUDE1	.14	.34**		
ATTITUDE2	.06	.16	.35**	

* p<0.05; **p<0.01

Relationships between Dependent Variables, Pharmacy Characteristics, and Respondent Demographics

To determine which variables had significant relationships with the dependent variables in order to appropriately control for them in later analyses, pharmacy characteristics and respondent demographics were examined for the possibility of systematic variation. Specifically, bivariate relationships were examined between pharmacy characteristics (number of staff pharmacists employed, number of technicians employed, total number of employees, number of hours the pharmacy is open per week, average prescription volume, and approximate percentage of patients over 65 years of age), respondent demographics (sex, education, job title, number of years practicing as a pharmacist, number of years practicing as a pharmacist at the current site, number of years as a pharmacy manager/owner, and number of years as a pharmacy manager/owner at the current site), and the dependent variables (offering of quality improvement-related initiatives, use of EQuIPP, and performance).

Offering of quality improvement-related initiatives. Analyses for categorical variables (sex, education and job title) and offering of quality improvement-related initiatives were conducted using independent t-tests and one-way ANOVAs. Among these analyses, there were no statistically significant differences between variables.

Analyses for continuous variables (e.g., number of years practicing as a pharmacist, number of staff pharmacists employed, average prescription volume, etc.), regression models were used. The results of the regression analyses identified one variable, total number of employees, that had a significant relationship with the offering of quality improvement-related initiatives, r=.235. In this regression analysis, 5.5% of the variance in offering of quality improvement-related initiatives can be explained by total number of employees.

Use of EQuIPP. Analyses of pharmacy characteristics and respondent demographics for possible association with use of EQuIPP were conducted using logistic regression. Results of these analyses indicated that total number of employees explains 4.9% (Cox & Snell R-square) to 6.5% (Nagelkerke R-Square) of the variation in use of EQuIPP. No other logistic regression models conducted to analyze use of EQuIPP, pharmacy characteristics, and respondent demographics revealed statistically significant relationships.

Performance. Analyses for categorical variables (sex, education and job title) and performance were conducted using independent t-tests and one-way ANOVAs. Results of these analyses revealed that sex had a statistically significant relationship with performance ($F=9.24$, $p<0.01$). No additional statistically significant relationships were observed between categorical variables and performance.

Analyses for continuous variables and performance were conducted using linear regression models. Only one regression model indicated a statistically significant relationship between performance and pharmacy characteristics. Specifically, the results of the regression analysis indicated that there was a positive relationship between performance and average prescription volume, $R=.220$. In this regression analysis, 4.8% of the variance in performance can be explained by average prescription volume. No other regression models revealed statistically significant relationships between continuous variables and performance.

Multivariate Analyses

The purpose for conducting multivariate analyses was to better understand what factors are associated with the offering of quality improvement-related initiatives and the use of EQuIPP and whether offering of quality improvement-related initiatives and use of EQuIPP are associated with pharmacy performance on the star rating measures. Additionally, it was of

interest to determine which leadership characteristics, if any, modify the relationships between the offering of quality improvement-related initiatives and pharmacy performance on the star rating measures. The results of these analyses are presented in the following sections.

Predisposing Factors

Offering of quality improvement-related initiatives. The "Offering of Quality Improvement-related Initiatives" variable was calculated as the sum of the quality improvement-related initiatives that each respondent indicated having offered in the past 12 months in their pharmacy. The summed values ranged from "0" for no quality improvement-related initiatives offered in the past 12 months to a potential value of "9" if the respondent reported offering each of the quality improvement-related initiatives listed on the questionnaire. Therefore, a higher value for "Offering of Quality Improvement-related Initiatives" indicates more services being offered at a particular pharmacy.

To test the study hypothesis H1, hierarchical linear regression was used. The results of the hierarchical regression model are presented in Table 4.12. In addition to the regression model testing the study hypothesis, Table 4.12 also presents the Base model. The Base model consists of one control variable, "Total Number of Employees", and the dependent variable, "Offering of Quality Improvement-related Initiatives".

The Base model was analyzed to determine the amount of variance the control variable shares with the dependent variable, "Offering of Quality Improvement-related Initiatives". The Base model regression analysis revealed that the control variable accounted for approximately 5.5% (R^2=.055) of the variance in "Offering of Quality Improvement-related Initiatives" ($p<0.05$).

Table 4.12
Linear Regression Models Explaining Offering of Quality Improvement-related Initiatives[a]

Study Variables	Base Model		Model H1	
	β	*P*	β	*P*
Total Number of Employees	**.235**	**.027**	**.234**	**.016**
Predisposing factors				
Awareness	-	-	-.151	.112
Knowledge	-	-	**.319**	**.002**
Attitude1	-	-	.173	.108
Attitude2	-	-	.136	.184
Model R^2	.055		.265	
Model R^2_{change}	-		.209	

[a]N=90; Significant variables in each model are bold

The Model denoted Model H1 in Table 4.12 utilized a hierarchical regression model to determine the relationship between Predisposing Factors, using the 4 predisposing factors variables (Awareness, Knowledge, Attitude1 and Attitude2) and the "Offering of Quality Improvement-related Initiatives" while controlling for the effect of "Total Number of Employees". The control variable was entered in the first step and the 4 predisposing factors independent variables were entered in the second step.

Analysis of the regression model indicated that inclusion of Predisposing Factors (Awareness, Knowledge, Attitude1 and Attitude2) improved the association with Offering of Quality Improvement-related Initiatives above and beyond Total Number of Employees alone. The full model of Total Number of Employees and Predisposing Factors to determine association with the Offering of Quality Improvement-related Initiatives (Model H1) was statistically significant, R^2=.265, F(5,83)=5.974, p<.01; adjusted R^2=.220. The addition of Predisposing Factors led to a statistically significant increase in R^2 of .209, F(4,83)=5.910, p<.05 above and beyond the Base model alone. Specifically, Knowledge was significantly associated with the Offering of Quality Improvement-related Initiatives. As knowledge increases, so does the number of quality improvement initiatives offered. The regression results support Hypothesis H1; therefore, the null hypothesis is rejected. Predisposing Factors are associated with the Offering of Quality Improvement-related Initiatives.

Use of EQuIPP. Use of EQuIPP was a binary variable where "0" indicated the pharmacy did not have access to EQuIPP or had access but did not use the EQuIPP platform. A value of "1" indicated the pharmacy had access to and used the EQuIPP platform. There were a total of 46 pharmacies (51.1%) that had access to EQuIPP and reported using the platform. The

remaining 44 pharmacies (48.9%) either did not have access to EQuIPP or had access but reported not using the platform.

To test study hypothesis H2, hierarchical binary logistic regression was utilized. The results of the hierarchical binary logistic regression are presented in Table 4.13. In addition to the regression model testing the study hypothesis, Table 4.13 also presents the Base model.

Table 4.13
Logistic Regression Models Explaining Predisposing Factors Association with Use of EQuIPP[a]

Study Variables	**Base Model**								**Model H2**							
	B	S.E.	Wald	d.f.	P	Odds Ratio	95% CI for Odds Ratio		B	S.E.	Wald	d.f.	p	Odds Ratio	95% CI for Odds Ratio	
Total Number of Employees	**.071**	**.036**	**3.854**	**1**	**.0496**	**1.074**	**1.00**	**1.15**	.057	.035	2.544	1	.111	1.058	.987	1.134
Awareness	-	-	-	-	-	-	-	-	.072	.063	1.329	1	.249	1.075	.951	1.215
Knowledge	-	-	-	-	-	-	-	-	.077	.040	3.626	1	.057	1.080	.998	1.169
Attitude1	-	-	-	-	-	-	-	-	**.184**	**.063**	**8.482**	**1**	**.004**	**1.201**	**1.062**	**1.359**
Attitude2	-	-	-	-	-	-	-	-	**-.237**	**.108**	**4.780**	**1**	**.029**	**.789**	**.638**	**.976**
Model chi-Square					4.55*								19.45**			
Degrees of Freedom					1								5			
-2 Log Likelihood					115.95								96.52			
Cases correctly classified (%)					66.7								66.7			

[a]N=88. Significant variables are bolded. Model significance: *p<0.05, **p<0.01

The Base model consists of the one control variable, Total Number of Employees, and the dependent variable, Use of EQuIPP.

Results of the logistic regression show that the Base model is statistically significant ($X2=4.55$; $df=1$; $p<0.05$). The model explained 5.1% (Cox & Snell) to 6.8% (Nagelkerke) of the variance in Use of EQuIPP and correctly classified 66.7% of cases. Sensitivity was 62.2%, specificity was 71.4%, positive predictive value was 70.0% and negative predictive value was 63.8%. The results suggest that for every one unit increase in Total Number of Employees, the odds of using EQuIPP increase by 1.074. Hence, the model indicates that Total Number of Employees is statistically significantly associated with of Use of EQuIPP.

The model denoted Model H2 in Table 4.13 utilized hierarchical logistic regression to determine the relationship between Predisposing Factors, using the 4 predisposing factors variables (Awareness, Knowledge, Attitude1 and Attitude2) and the Use of EQuIPP while controlling for the effect of Total Number of Employees. The control variable was entered in the first step and the 4 predisposing factors independent variables were entered in the second step.

Analysis of the hierarchical logistic regression model indicated that inclusion of Predisposing Factors (Awareness, Knowledge, Attitude1 and Attitude2) improved the prediction of Use of EQuIPP above and beyond Total Number of Employees alone. The full model of Total Number of Employees and Predisposing Factors to predict Use of EQuIPP (Model H2) was statistically significant ($X2=19.45$; $df=5$; $p<0.01$) and explained 24.1% (Cox & Snell) to 32.1% (Nagelkerke) of the variance in Use of EQuIPP. Specifically, for every one unit increase in Attitude1, the odds of using EQuIPP increase by 1.201 while every one unit increase in Attitude2 results in a decreased odds of using EQuIPP by 0.789. The overall results of the regression

model support Hypothesis H2; therefore, the null hypothesis is rejected. Predisposing Factors are associated with the Use of EQuIPP.

Performance

To test study hypothesis H3, hierarchical linear regression was used. The results of the hierarchical regression model are presented in Table 4.14. In addition to the regression model testing the study hypothesis, Table 4.14 also presents the Base model. The Base model consists of the two control variables, Sex and Average Prescription Volume per Day, and the dependent variable, Performance.

The Base model was analyzed to determine the amount of variance the control variables share with the dependent variable, Performance. The Base model regression analysis revealed that the control variables accounted for approximately 20.7% (R^2=.207) of the variance in Performance ($p<0.01$). Specifically, being of female sex was statistically significantly associated with global pharmacy performance on the star rating measures.

Table 4.14
Hierarchical Linear Regression Models Explaining Pharmacy Performance (N=86)[a]

	Base Model		Model H3		Model H4	
Study Variables	*B*	*p*	*B*	*p*	*B*	*p*
Sex	**.386**	**.000**	**.386**	**.000**	**.404**	**.000**
Average Rx Volume	-.188	.064	-.188	.069	**-.210**	**.041**
Use of EQuIPP	-	-	.001	.995	-	-
Offering of Quality Improvement-related Initiatives	-	-	-	-	.135	.187
Model R^2	.207		.207		.224	
Model R^2 Change	-		.000		.017	

[a]Significant variables in each model are bold.

Use of EQuIPP. The model denoted Model H3 on Table 4.14 utilized a hierarchical linear regression model to determine the relationship between Performance and Use of EQuIPP while controlling for the effects of Sex and Average Prescription Volume per Day. The control variables were entered in the first step and independent variable, Use of EQuIPP, was entered in the second step.

Analysis of the regression model indicated that inclusion of Use of EQuIPP did not improve the prediction of Performance above and beyond Sex and Average Prescription Volume per Day. Hence, the results do not support Hypothesis H3; accordingly, the null hypothesis is not rejected. Use of EQuIPP is not an important factor in pharmacy Performance on the star rating measures.

Offering of quality improvement-related initiatives. The model denoted Model H4 on Table 4.14 utilized a hierarchical linear regression model to determine the relationship between Performance and the Offering of Quality Improvement-related Initiatives while controlling for the effects of Sex and Average Prescription Volume per Day. The control variables were entered in the first step and independent variable, Offering of Quality Improvement-related Initiatives, was entered in the second step.

Analysis of the regression model indicated that while controlling for Sex and Average Prescription Volume per Day, Offering of Quality Improvement-related Initiatives account for approximately 1.7% ($r^2_{change} = .017$) of the variance in Performance; however, this difference is not statistically significant ($F_{change} = 1.775$, (1,80), $p = 0.187$). Hence, the results do not support Hypothesis H4; accordingly, the null hypothesis is not rejected. The offering of Quality Improvement-related Initiatives is not an important factor in pharmacy Performance on the star rating measures.

Leadership

To test hypothesis H5, H5a, H5b, H5c, H5d, and H6, hierarchical linear regression models were used. The results are presented in Table 4.15. To create an interaction variable and test for the moderator effect of leadership, both the Offering of Quality Improvement-related Initiatives independent variable and the Leadership independent variables were first centered and then multiplied together. This procedure helps to reduce collinearity in moderation analysis.

Hypothesis H5 utilized a hierarchical linear regression model that examined the relationship between the Offering of Quality Improvement-related Initiatives and Transformational Leadership. The two control variables, Sex and Average Prescription Volume per Day were entered in the first step. Next, the 2 centered independent variables, Offering of Quality Improvement-related Initiatives – centered and Transformational Leadership – centered, were entered in the second step. In the third step, the interaction variable, Offering of Quality Improvement-related Initiatives – centered multiplied by Transformational Leadership – centered, were entered.

The results of the analysis indicated that while controlling for the effects of Sex and Average Prescription Volume per Day, the variance attributed to the interaction between the Offering of Quality Improvement-related Initiatives and Transformational Leadership was less than 1% ($R^2_{change} = .006$). The results do not support Hypothesis H5; therefore, the null hypothesis is not rejected. Transformational Leadership does not moderate the relationship between the Offering of Quality Improvement-related Initiatives and Performance on the star rating measures.

Table 4.15
Hierarchical Linear Regression Models Explaining Performance with Leadership as a Moderator[a]

	Base Model		Model H5		Model H5a		Model H5b		Model H5c		Model H5d		Model H6	
Study Variables	***β***	***p***	***β***	***p***	***β***	***p***	***β***	***p***	***β***	***p***	***β***	***p***	***β***	***p***
Sex	**.386**	**.000**	**.407**	**.000**	**.409**	**.000**	**.401**	**.000**	**.405**	**.000**	**.405**	**.000**	**.393**	**.000**
Average Rx Volume	-.188	.064	**-.211**	**.044**	**-.207**	**.047**	**-.217**	**.036**	**-.211**	**.044**	-.191	.070	**-.230**	**.029**
Offering of Services	-	-	.131	.222	.120	.259	.146	.171	.154	.143	.121	.246	.132	.201
Transformational Leadership	-	-	-.020	.851	-	-	-	-	-	-	-	-	-	-
Idealized Influence	-	-	-	-	.048	.652	-	-	-	-	-	-	-	-
Inspiration Motivation	-	-	-	-	-	-	-.070	.504	-	-	-	-	-	-
Intellectual Stimulation	-	-	-	-	-	-	-	-	-.147	.162	-	-	-	-
Individual Consideration	-	-	-	-	-	-	-	-	-	-	.077	.457	-	-
Transactional Leadership	-	-	-	-	-	-	-	-	-	-	-	-	-.083	.418
Services * Transformational	-	-	-.081	.426	-	-	-	-	-	-	-	-	-	-
Services * II	-	-	-	-	-.019	.850	-	-	-	-	-	-	-	-
Services * IM	-	-	-	-	-	-	-.095	.354	-	-	-	-	-	-
Services * IS	-	-	-	-	-	-	-	-	-.173	.089	-	-	-	-
Services * IC	-	-	-	-	-	-	-	-	-	-	-.035	.731	-	-
Services * Transactional	-	-	-	-	-	-	-	-	-	-	-	-	-.065	.519
Base Model R2	.207		.207		.207		.207		.207		.207		.207	
Model2 R2	-		.224		.227		.227		.237		.231		.231	
Model 3 R2	-		.231		.227		.235		.265		.232		.236	
Interaction R2change	-		.006		.000		.009		.028		.001		.005	

[a]N=88; Significant variables for each model are in bold.

Hypothesis H5a utilized a hierarchical linear regression model that examined the relationship between the Offering of Quality Improvement-related Initiatives and Idealized Influence. The two control variables, Sex and Average Prescription Volume per Day were entered in the first step. Next, the 2 centered independent variables, Offering of Quality Improvement-related Initiatives – centered and Idealized Influence – centered, were entered in the second step. In the third step, the interaction variable, Offering of Quality Improvement-related Initiatives – centered multiplied by Idealized Influence – centered, were entered.

The results of the analysis indicated that while controlling for the effects of Sex and Average Prescription Volume per Day, the variance attributed to the interaction between the Offering of Quality Improvement-related Initiatives and Idealized Influence was less than 1% (R^2_{change} = .000). The results do not support Hypothesis H5a; therefore, the null hypothesis is not rejected. Idealized Influence does not moderate the relationship between the Offering of Quality Improvement-related Initiatives and Performance on the star rating measures.

Hypothesis H5b utilized a hierarchical linear regression model that examined the relationship between the Offering of Quality Improvement-related Initiatives and Inspiration Motivation. As with the previous regression models, the two control variables, Sex and Average Prescription Volume per Day, were entered in the first step. Next, the 2 centered independent variables, Offering of Quality Improvement-related Initiatives – centered and Inspiration Motivation – centered, were entered in the second step. In the third step, the interaction variable, Offering of Quality Improvement-related Initiatives – centered multiplied by Inspiration Motivation – centered, were entered.

As with previous analyses, the results of the analysis indicated that while controlling for the effects of Sex and Average Prescription Volume per Day, the variance attributed to the

interaction between the Offering of Quality Improvement-related Initiatives and Inspiration Motivation was less than 1% (R^2_{change} = .009). The results do not support Hypothesis H5b; therefore, the null hypothesis is not rejected. Inspiration Motivation does not moderate the relationship between the Offering of Quality Improvement-related Initiatives and Performance on the star rating measures.

Hypothesis H5c utilized a hierarchical linear regression model that examined the relationship between the Offering of Quality Improvement-related Initiatives and Intellectual Stimulation. The two control variables were entered in the first step while the 2 centered independent variables, Offering of Quality Improvement-related Initiatives – centered and Intellectual Stimulation – centered, were entered in the second step. In the third step, the interaction variable, Offering of Quality Improvement-related Initiatives – centered multiplied by Intellectual Stimulation – centered, were entered.

The results of the regression analysis indicated that while controlling for the effects of Sex and Average Prescription Volume per Day, the variance attributed to the interaction between the Offering of Quality Improvement-related Initiatives and Inspiration Motivation was approximately 2.8% (R^2_{change} = .028); however, the results were not statistically significant. The results do not support Hypothesis H5c; therefore, the null hypothesis is not rejected. Intellectual Stimulation does not moderate the relationship between the Offering of Quality Improvement-related Initiatives and Performance on the star rating measures.

Hypothesis H5d utilized a hierarchical linear regression model that examined the relationship between the Offering of Quality Improvement-related Initiatives and Individual Consideration. As with the previous regression models, the two control variables, Sex and Average Prescription Volume per Day, were entered in the first step. Next, the 2 centered

independent variables, Offering of Quality Improvement-related Initiatives – centered and Individual Consideration – centered, were entered in the second step. In the third step, the interaction variable, Offering of Quality Improvement-related Initiatives – centered multiplied by Individual Consideration – centered, were entered.

As with previous analyses, the results of the analysis indicated that while controlling for the effects of Sex and Average Prescription Volume per Day, the variance attributed to the interaction between the Offering of Quality Improvement-related Initiatives and Individual Consideration was less than 1% (R^2_{change} = .001). The results do not support Hypothesis H5d; therefore, the null hypothesis is not rejected. Individual Consideration does not moderate the relationship between the Offering of Quality Improvement-related Initiatives and Performance on the star rating measures.

The final study hypothesis, Hypothesis H6, utilized a hierarchical linear regression model that examined the relationship between the Offering of Quality Improvement-related Initiatives and Transactional leadership. The two control variables, Sex and Average Prescription Volume per Day were entered in the first step. Next, the 2 centered independent variables, Offering of Quality Improvement-related Initiatives – centered and Transactional Leadership – centered, were entered in the second step. In the third step, the interaction variable, Offering of Quality Improvement-related Initiatives – centered multiplied by Transactional Leadership – centered, were entered.

As with previous models, the results of the analysis indicated that while controlling for the effects of Sex and Average Prescription Volume per Day, the variance attributed to the interaction between the Offering of Quality Improvement-related Initiatives and Transactional Leadership was less than 1% (R^2_{change} = .005). The results do not support Hypothesis H6;

therefore, the null hypothesis is not rejected. Transactional Leadership does not moderate the relationship between the Offering of Quality Improvement-related Initiatives and Performance on the star rating measures.

Chapter 5. Discussion

This chapter discusses the study findings in context with the review of the literature to review any differences between the existing literature and the research findings, identify the implications of the information that emerged from the research, and recommend areas and opportunities for future study.

Phase I: Qualitative Phase

Specific Aim 1

Phase I of this dissertation research utilized key informant interviews to gain a greater understanding the current awareness, knowledge, and attitudes toward the CMS star rating system as well as the initiatives that are currently being conducted in community pharmacies that pharmacy owners associate with quality care. Four themes were identified that fell into four categories: 1) Awareness, 2) Attitudes, 3) Relationships, and 4) technology. In the following sections, these themes will be discussed in more detail.

Awareness

The first major theme from the interviews with owners of independent pharmacies in Alabama was the awareness of the star rating system. Previous research has not investigated awareness of the star rating system among pharmacists and therefore, this dissertation contributes to the literature by gaining a better understanding of the level of awareness among pharmacy owners. This theme is comprised of 2 sub-themes: 1) superficial awareness of star ratings and 2) advanced knowledge of star ratings.

Superficial awareness of star ratings. For the most part, all pharmacy owners were aware of the star ratings being used to evaluate Medicare plans and that some of these measures could be directly impacted by pharmacists. Despite being aware of the star rating system, in-depth knowledge of the specific star rating measures in regards to what they measure and specifically how they are calculated was lacking. This was particularly interesting because the pharmacy owners knew that these measures were being used to evaluate their performance yet did not think the measurement and evaluation of their performance was an urgent enough matter to seek information regarding how the measures were being calculated. Without knowledge of what goes into the calculation of the star measures, it would be difficult to implement a meaningful change to address any shortfalls in performance. Perhaps the reason these pharmacy owners were not concerned about the methods used to calculate performance was that these were high performing pharmacies. The owners of these pharmacies knew about the measures and the majority knew their performance was higher than state averages. Therefore, because they knew they were performing at a high level, they were satisfied with their performance and may not see a need to research what goes into the calculation of performance. In their opinion, they are performing well and see no reason to change what they are doing. This is consistent with the satisficing principle in which organizations settle "good enough" outcomes instead of attempting to attain the best possible outcomes (Cyert & March, 1992). Questions that target knowledge and awareness of the star rating measures on the self-administered questionnaire should be able to determine if high performance is associated with lack of awareness due to this lack of urgency.

Advanced knowledge of star ratings. While the majority of pharmacy owners knew of the star ratings, only a select few had advanced knowledge of the measures being used to

calculate their performance. From the interviews with pharmacy owners, it seemed that the few who had advanced knowledge of how the measures were calculated were more active in their monitoring and benchmarking of their performance and in their future plans for improvement. For example, one pharmacy owner seemed concerned with their performance on the diabetes-related measure. When asked about this measure, he explained that he had a specific plan in place to address the pharmacy's performance in this area with a plan to roll out a program targeting their diabetic patients and that he had already discussed the plan for improvement with his employees. As might be expected, it appears that those who know more about the star ratings and how they are calculated are better prepared to address shortfalls in performance. Additionally, despite current high performance, pharmacies with specific knowledge of the star ratings are putting plans in place to continuously improve their quality. Questions that differentiate awareness from knowledge on the Phase 2 questionnaire may help to distinguish if there is an association between awareness and performance or whether advanced knowledge is more closely associated with performance.

Attitudes

The second major theme from the interviews with high-performing community pharmacy owners was attitudes toward the star rating measures and performance measurement. Specifically, this theme is comprised of 3 sub-themes: 1) positive attitudes towards star ratings, 2) skeptical of rewards for performance, and 3) lack feeling of control.

Positive attitudes towards star ratings. The majority of the pharmacy owners felt that the measures were a good thing if they were used in an appropriate way. Pharmacy owners felt that using the measures to monitor their performance would be fine and they would welcome bonus payments for high performance or improvement in performance scores. This was very

different from the tone of other healthcare professionals that have had performance measures implemented, such as physicians, hospitals and nursing homes; they have generally been negative at first introduction (Meterko et al., 2006). Some of the pharmacy owners stated that they felt the introduction of pharmacy performance measurement and monitoring by insurance companies would encourage and facilitate them to increase their interaction with patients that could affect their performance scores. They also saw the measurement as an opportunity to get to know patients that may have slipped under their radar. For example, one pharmacy owner explained that they felt the relationships with the majority of their regular patients was very personal but there were some that only come in when they need to pick up their medications and do not ask any questions or feel the need to talk about their medication regimens with the pharmacists. The measurement, according to the pharmacy owner, gives the pharmacists a good reason to start conversations with patients and could identify issues patients are having with their medications, such as cost or side effects. Overall, the majority of pharmacy owners thought that increased interaction with patients as a result of performance monitoring would help to ensure patients receive the best possible care in their pharmacies.

Skeptical of rewards for performance. Despite being positive about the potential improvement in patients outcomes that could come as result of performance measurement and monitoring, when asked what they thought about a portion of their payment being tied to their performance, key informants were skeptical that they would receive rewards for high performance. When asked what they thought about pharmacies receiving bonus payments for high performance, pharmacy owners said they would definitely welcome any additional payments but did not believe they would actually happen. On the other hand, they felt it was more likely that pharmacies would be punished in the form of lower reimbursements for poor

performance. This was interesting because it demonstrates the stressed relationships between pharmacies and payers. The key reason for their distrust could be because pharmacy owners believed that the insurance companies do not pay a reasonable amount for the services and medications they provide and are "always trying to lower how much they pay (pharmacies)." It seems that pharmacy owners and managers do not trust that they will ever receive any benefit from providing high quality care despite one payer already offering bonus payments for high performance.

Lack feeling of control. Pharmacy owners were less accepting of the possibility that future provider agreements with insurance companies could include penalties for low performance or even the inability to provide services for certain patients based on performance ratings. Pharmacy owners explained that the reason they were against penalties for low performance was the lack of the ability to control aspects of patient care. For example, pharmacy owners explained that the medication adherence measures are based on patient refills but that there is no way to force a patient to pick up their refill. They also explained that the appropriate care of patients with diabetes measure requires patients with diabetes and hypertension to be on a medication for their hypertension but, because pharmacists are not prescribers, a patient's physician has to agree to add an antihypertensive medication to the patient's regimen. Therefore, although pharmacy owners agree that they can influence patients to pick up medication refills and can call physicians to request the addition of medications, there is no guarantee that either will occur. Although they mentioned that they would not support the use of the measures in a way that included penalties, the majority of owners did not seem overly concerned that the measured would be used in that way.

A potential contributing factor to the overall positive attitudes of the pharmacy owners interviewed could have been the high performance of these pharmacies on the star ratings. In other words, they may have been accepting of the measures being used to monitor their performance because they knew that they were high performers with little to worry about. While there was concern that the measures could be used to penalize poor performance, they did not dwell on this possibility because they performed at a high level and therefore their performance would not be penalized if penalties were introduced. Another potential reason for the positive attitudes of the pharmacy owners is their awareness of the measures and their familiarity with their performance. For those pharmacy owners who are unaware that the performance of their pharmacies is being calculated and therefore are unaware of how they perform, a different and perhaps more negative attitude may be present. Discovery of this possibility led to items being created for the questionnaire that explore both awareness and attitude to determine if there is any relationship between the two constructs. Either way, it was interesting that the high performing pharmacy owners generally had positive attitudes towards performance measurement while in the past, introduction of these kinds of measures have led to frustration and anger among healthcare organizations (Meterko, et al., 2006).

Relationships

The third major theme that was discovered from analysis of the interviews with high-performing pharmacy owners was the emphasis on the importance of 1) relationships with patients and 2) relationships with employees.

Relationships with patients. Independent community pharmacies are known for their relationships with their patients and it seems that this is one of the major factors that is considered in everything that they do (Harmison, 2010). When pharmacy owners were asked

what they believe they do that contributes to their high performance, the majority responded that their genuine care for their patients and their willingness to work with patients to ensure they receive the best possible care they can provide is something that they believe they do better than pharmacies that do not perform as well. This is an interesting finding because it suggests that simply treating patients with respect and having a relationship with patients can contribute to better patient adherence. It also makes sense because, if a pharmacist has a relationship with their patients, they will know the health status of their patients and be better able to recognize if a patient is on a medication that is inappropriate or if a patient needs to be on a medication that they are not currently prescribed. Additionally, good relationships are built on trust. When a patient trusts their provider, they are more likely to express any concerns they have with their treatment and let the provider know if they are having trouble with any of their medications (Worley-Louis, Schommer, & Finnegan, 2003). This leads to the realization of opportunities to intervene with patients that benefit both patients and the pharmacists.

Relationships with employees. When asked about the relationships owners have with their employees, the overall theme of the responses was consistent with that of transformational leaders. For example, owners mentioned the importance of getting employee input during decision making and being very transparent when making decisions to implement new services or technology. By including employees in the decision making process and encouraging them to think outside the box to solve issues, employees have a vested interest in whatever new process or service is being implemented because they feel they contribute to the improvement of their pharmacies. This inclusion of lower level employees in the decision making process has been shown in previous research to be associated with organizational performance and may contribute to the high performance of these pharmacies on the star rating measures (Spreitzer & Mishra,

1999). Additionally, the inclusion of lower level employees in the decision-making process can be viewed as the owner or manager's attempt to intellectually stimulate their employees and therefore, could be associated with a transformational leadership style. Another interesting finding was that these pharmacy owners did not seem to use their position to impose strict rules and penalties for not meeting goals. In their leadership role, pharmacy owners of high performing pharmacies act as captains of their respective teams. They work towards collective goals while overseeing the progress and making suggestions to improve. Instead of delegating specific responsibilities to single employees, they encourage all employees to work together to solve problems and train multiple employees to perform specific duties so that they can collectively work towards their common goals. These leadership qualities are also closely associated with the 4 I's of transformational leadership. To investigate this further and test this dissertation's hypotheses, questions about the relationships owners have with employees were included on the questionnaire to determine if this collective, participatory mindset is unique to high-performing pharmacies or if this is something that all independently-owned community pharmacies have in common and whether these leadership qualities are associated with pharmacy performance.

Technology

The fourth and final theme from the interviews with high-performing independently-owned community pharmacy owners was their use of technology. It was interesting to find that all pharmacy owners felt their pharmacy technology was a vital part of their daily operations and a great tool to help improve the care they provide for their patients. The pharmacy owners explained the benefits of their computer systems and how these systems help them improve the care they provide to their patients. For example, they explained that Prescribe Wellness could be

used to identify patients who were due or late for refills, synchronize patient medications so patients can pick up medications for multiple conditions on the same day, and identify patients with specific conditions for interventions. This is consistent with research on the use of computer alert systems, refill reminders, and other technology that has been shown to aid pharmacies in providing care and improving patient outcomes (Indermitte, et al., 2007; Petrilla, et al., 2005).

Despite their stated importance of technology, the use of EQuIPP was not frequent among pharmacy owners. This was interesting because the use of pharmacy technology specific to patient care services (alert systems, refill reminders, etc.) was part of the daily routine for most owners but EQuIPP was only accessed occasionally. Perhaps one reason for this is that EQuIPP is a monitoring tool that does not need to be used as frequently as other technology that enhances patient care. Also, the vast array of technology that was in use was interesting and suggests that potentially, the use of a specific technology is less important than the frequency of use of technology in general when trying to achieve high performance. This is consistent with previous research conducted in hospitals that found 2 different computer systems both improved patient outcomes and therefore, it was not the system that resulted in the improvement but the structure the use of the system brought that caused the improvement (McLaughlin, McLaughlin, & Kaluzny, 2004) Additionally, the use of multiple software systems may contribute to high performance since many of the pharmacy owners stated that, while not using EQuIPP often, they did use it occasionally to print reports and monitor performance. This also highlights the importance of monitoring performance outcomes in pharmacies. It is possible that high-performing pharmacies have the continuous monitoring of outcomes in common with one another. Continuous monitoring of outcomes is a one of the major components of Continuous

Quality Improvement (CQI) that has been shown to improve the quality of patient care and outcomes in a variety of healthcare settings (Barton, Danek, Johns, & Coons, 1998; Boyle, Ho, MacKinnon, Mahaffey, & Taylor, 2013). Questions about the specific software systems and their frequency of use as well as the frequency of monitoring performance on the star ratings were included in the questionnaire to determine associations between technology use, monitoring, and performance. Also, specific questions about the ease of use and usefulness of EQuIPP were included to get a better understanding of owner perceptions of the software. If EQuIPP is the paramount system to monitor and improve performance, perhaps there is some other barrier to its use that can be uncovered.

Overall, the interviews with pharmacy owners of independent community pharmacies generated useful information to be used in the creation of the questionnaire disseminated in phase 2 of this dissertation. The 4 themes that were most apparent in the interviews were consistent with previous literature and further support the hypotheses of this dissertation. For high-performing pharmacies, these interviews suggest that the level of awareness of the star rating measures, overall positive attitudes towards the star ratings, the relationships pharmacy owners have with their patients and their employees, and the use of technology as a tool to enhance patient care may contribute to high-performance on the star rating measures. The second phase of this dissertation aims to determine if these constructs are associated with pharmacy performance.

Phase II: Quantitative Phase

Phase 2 of the dissertation utilized a cross sectional study design with data collected from pharmacy owners/managers of independently-owned community pharmacies in Alabama as well as pharmacy performance data that was provided by Pharmacy Quality Solution and CECity.

This quantitative study had two main goals. First, this study aimed to identify factors that are associated with the offering of quality improvement-related initiatives in pharmacies and the use of quality improvement monitoring software, specifically the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP). Second, this study aimed to determine the factors that are associated with performance on the star rating measures being used to evaluate Medicare Part C and Part D plans.

Specific Aim 2

Specific Aim 2 was to explore pharmacists' knowledge, awareness, and attitudes toward quality measures as well as quality improvement-related initiatives offered in Alabama pharmacies and differences in leadership styles. This specific aim included Research Questions 1 through 5.

Research Question 1

Research question 1 was to determine the current awareness, knowledge, and attitude of pharmacy owners/managers towards star ratings. The results of this study suggest that the majority of pharmacy owners are aware and knowledgeable about pharmacy star ratings but lack confidence in their understanding of the specific details. Regarding knowledge specifically, although the majority of respondents answered 5 of the 6 questions correctly, more than half were either not confident or somewhat confident in their answers. Lack of confidence in their awareness and knowledge may lead pharmacy owners to be hesitant when making decisions about services to offer or changes to be made to improve performance.

The results of this study suggest that there are 2 specific attitude types when viewing the star ratings. It seems that pharmacy owners have one distinct attitude towards the star ratings and what they represent as well as the information they have about the star rating while also having

another distinct attitude about the role of the role the pharmacist should play in improving star ratings. In other words, a pharmacy owner could have a positive attitude toward the star ratings and how they are measured while having a negative attitude toward putting extra effort into improving those same ratings.

Research Question 2

Research question 2 was to determine what quality improvement-related initiatives are being offered in community pharmacies. To explore the Offering of Quality Improvement-related Initiatives in independently-owned community pharmacies, pharmacy owners given a list of 9 initiatives that were identified in previously published literature and qualitative interviews from phase I of this dissertation and asked to indicate the initiatives offered at their pharmacies. and the total number of initiatives was summed to get an overall score. The average number of initiatives offered was approximately 5 with the most frequently offered initiatives being computerized warning systems (96.7%), Medication Therapy Management (94.4%) and educational pamphlets or printouts (90.0%).

Looking closer at the various initiatives and the way total initiatives was calculated for this study, first, it is important to note that all initiatives were given an equal weight. For example, offering Medication Therapy Management and offering of educational pamphlets or printouts were both counted as "1" in the total number of initiatives offered. This may be an issue in the measurement of offering of services since one service may potentially be more impactful than another. Using the previous example of Medication Therapy Management and educational pamphlets or printouts, research has found that Medication Therapy Management is a very powerful initiative that has great impact on patient non-adherence as well as patient use of

health care (M. Viswanathan, Kahwati, Golin, & et al., 2015). On the other hand, patient educational pamphlets or printouts may not be as impactful.

Additionally, when looking at each of the initiatives individually, some require more effort on the part of the pharmacist than others. It is interesting that some of the more difficult initiatives, such as Medication Therapy Management and blister/bubble packaging, were provided in a majority of independently-owned community pharmacies while less than half of the pharmacies indicated providing the easier services, such as automated or personal telephone reminders to refill prescriptions. It would seem that offering automated or personal telephone reminders would be easy initiatives to offer and previous research has shown that these reminder calls improve patient adherence (Meera Viswanathan et al., 2012) but for one reason or another, pharmacies are not providing these services. This finding may indicate a lack of awareness to the benefits of reminder calls for prescription refills. Another possibility is that this finding may indicate a wariness of pharmacies to invest in initiatives with high initial costs and uncertain return on investment, such as automated telephone reminder systems. With Medication Therapy Management, the return on investment is known and comes in the form of reimbursements from insurance plans for each patient that receives MTM. Finally, this study did not identify the number of MTMs provided in each pharmacy. Therefore, MTM might not be that difficult of an initiative to offer if the pharmacy is only offering the initiative to a handful of patients. This should be considered in future studies that aim to determine factors associated with the offering of quality improvement-related initiatives.

Regarding the use of the Electronic Quality Improvement Platform for Plans and Pharmacies, more than half of respondent pharmacies indicated that they were using the platform. Interestingly, when asked how they used EQuIPP, the lowest percentage of

respondents indicated using the platform to benchmark themselves against other pharmacies in Alabama or other pharmacies in their geographic location. This suggests that users of EQuIPP are not using the platform to its full potential. This is especially interesting because of the way stars for performance are being allocated. The current method for allocating stars to pharmacies is based on how a pharmacy performs in comparison to other pharmacies in their state or region. In other words, the top 20% of performers will earn 5 stars, the pharmacies performing between the 60^{th} – 80^{th} percentile will earn 4 stars, and so on. This means that one of the most important features of EQuIPP is the ability to see how a pharmacy is performing in comparison to pharmacies in the same region or state and yet very few EQuIPP users are utilizing this feature. Educating pharmacy owners on the importance of monitoring performance and benchmarking against competitors so that they are able to identify when there are changes that should be implemented is vital. Ensuring stakeholders, such as pharmacy owners, are aware of the need to monitor their performance is the foundation of any quality improvement initiative (Kritchevsky & Simmons, 1991).

Research Question 3

Research question 3 was to determine what leadership styles were present in independently-owned community pharmacies in Alabama. Results suggest that there are higher levels of transformational leadership than transactional leadership. Specifically, individual consideration was the transformational leadership characteristic that was most highly scored among pharmacy owners/managers. With the changing landscape in pharmacy from a product oriented profession to a more service oriented profession, this high level of individual consideration will help pharmacy employees to embrace new learning opportunities through a coaching or mentoring atmosphere where the needs of the individual employees are recognized

(Firth-Cozens & Mowbray, 2001). Although pharmacy owners had higher levels of transformational leadership than transactional leadership on average, many pharmacy owners displayed high levels of both leadership styles. This is consistent with Bass' (1985) conclusion that a leader does not necessarily fall on one end of a transformational – transactional leadership spectrum but that they can have characteristics of both types of leadership.

Research Question 4

Research question 4 was to determine the relationship between pharmacy predisposing factors and the offering of pharmacy quality improvement-related initiatives and the use of EQuIPP. As anticipated, results of hierarchical linear regression suggest that predisposing factors (Awareness, Knowledge, Attitude1 and Attitude2) were statistically significantly associated with the offering of quality improvement-related initiatives in community pharmacies. Predisposing factors explained approximately 21% (R^2_{change} = .209) of the variance observed in the offering of quality improvement-related initiatives after controlling for the total number of employees. A closer look at the model revealed that only one of the 4 predisposing factors, knowledge, made a significant contribution to the model and therefore was a significant factor when determining the extent of quality improvement-related initiatives offered in pharmacies. In other words, as knowledge of star ratings increased, the offering of quality improvement-related initiatives also increased. This finding is interesting because it suggests that the more knowledge a pharmacy owner has about star ratings, the more initiatives they offer in their pharmacies. Therefore, if the goal is to expand the role of the pharmacist in health care by offering more quality improvement initiatives, education about the star ratings may encourage pharmacy owners to seek out and implement initiatives.

As predicted, results of hierarchical logistic regression suggest that predisposing factors (Awareness, Knowledge, Attitude1 and Attitude2) were significantly associated with the use of EQuIPP in community pharmacies. Predisposing factors explained approximately 32% (Nagelkerke) of the variance in use of EQuIPP after controlling for total number of employees. Further inspection of the regression model revealed that only two of the four predisposing factors, Attitude1 and Attitude2, significantly contributed to the model. As was previously explained, Attitude1 is the respondent's attitude related to the pharmacy measures and the way they are calculated while Attitude2 is the respondent's attitude related to the role of the pharmacist in improving star ratings. Interestingly, for every one unit increase in Attitude1, the odds of using EQuIPP increase by 1.201 while every one unit increase in Attitude2 results in a decreased odds of using EQuIPP by 0.789. In other words, those that have positive attitudes towards the star ratings and the way they are calculated are more likely to use EQuIPP while those who have positive attitudes towards the role of the pharmacist to improve star ratings are less likely to use EQuIPP. This finding could be due to a number of potential reasons. For one, maybe pharmacy owners/managers that score highly on attitude2 are not aware of the existence of EQuIPP. Education about systems that are available to monitor performance could be helpful for these respondents. Another potential reason could be that these pharmacy owners/managers already believe that it is the pharmacist's job to intervene with patients for various reasons that concern patient safety and well-being. They don't see a reason to monitor their performance. They believe that it is the pharmacist's job to intervene and they are going to continue to intervene regardless of whether doing so has an impact on their performance or not.

Research Question 5

Research Question 5 was to determine the relationship between the offering of pharmacy quality improvement-related initiatives and pharmacy performance on the star rating measures as well as the relationship between the use of EQuIPP and pharmacy performance on the star rating measures. Results of hierarchical linear regression revealed that neither offering of quality improvement-related initiatives nor use of EQuIPP had a statistically significant relationship with pharmacy performance on the star rating measures.

These non-statistically significant findings could be explained from a measurement issue standpoint. As previously explained, all initiatives were weighted equally to determine the offering of quality improvement-related initiatives and pharmacies either used or did not use EQuIPP. Therefore, the non-statistically significant relationship could stem from how both independent variables were measured. For offering of quality improvement-related initiatives, some initiatives are potentially more impactful than others and should be given higher weights. For use of EQuIPP, the way the platform is used and its frequency of use may be more telling than an all-or-nothing calculation when trying to determine an association with performance. It is difficult to determine the best way to measure either independent variable because of the variability in the way they can be offered or used. Alternatively, a non-statistically significant result may be due to how the dependent variable was calculated. Pharmacy performance on the star rating measures is calculated with dispensing data from several prescription drug plans. Therefore, although the pharmacy may be offering quality improvement-related initiatives to selected groups of patients, the data from EQuIPP may not necessarily be from those selected groups. In other words, it is not possible to determine how the pharmacy is performing overall because performance is calculated with data from a select number of plans.

Interestingly, sex was found to have a very strong relationship with performance on the star rating measures. Previous research has suggested that transformational leadership may be a more feminine style of leading (Barbuto Jr, Fritz, Matkin, & Marx, 2007). Additionally, one study demonstrated that female leaders were rated as more transformational by their superiors and rated themselves as more transformational than their male counterparts (S. Carless, 1998). This, again, suggests that there may have been a potential measurement problem when measuring leadership. It is possible that female leaders had higher performing pharmacies because they were more transformational but because of the lack of variability in answers on the MLQ 5X(short), this was not observed. Future research is needed to further investigate the differences between female and male leaders and sex's relationship with performance on star rating measures in pharmacies.

Specific Aim 3

Specific Aim 3 was to determine under what type of organizational leadership the offering of quality improvement-related initiatives and the use of EQuIPP are associated with pharmacy performance on the CMS adopted measures when controlled for other covariates.

Research Question 6

Research Question 6 was to determine if leadership style modifies the relationship between the offering of pharmacy quality improvement-related initiatives and performance on the star rating measures or the relationship between the use of EQUIPP and performance on the star rating measures. Results of hierarchical linear regression revealed that leadership style did not have a statistically significant interaction effect with neither the relationship between the offering of pharmacy quality improvement-related initiatives and performance on the star ratings measures nor the relationship between use of EQuIPP and performance on the star rating

measures. The measurement issues with the offering of pharmacy quality improvement-related initiatives, use of EQuIPP, and pharmacy performance on the star rating measures were previously described. Those issues and the lack of variability in responses on the MLQ5X may be one reason that there is no interaction effect when leadership is added to the regression model as a moderator. The majority of respondents indicated "fairly often" or "frequently, if not always" on all but one item on the MLQ5X. The use of the pharmacy owner/managers as a key informant to assess their own leadership may have contributed to the high scores the respondents gave themselves. This study may have yielded different results had the subordinates rated the pharmacy owners/mangers. Additionally, it is possible that the leadership skills in independently-owned community pharmacies are not as pronounced as leadership skills in corporately owned pharmacies. Owners of independently-owned community pharmacies tend to act more like peers than managers in their interactions with employees. As opposed to many organizations, pharmacy owners/managers are typically pharmacists that share the responsibilities and decision-making with the other pharmacists. As the demographic characteristics of respondents and their pharmacies revealed, the average number of pharmacists employed at the independently-owned community pharmacies was approximately two and all respondents were pharmacists. Therefore, if the individual that filled out the questionnaire for this study was the pharmacy owner, there is a good chance that the other pharmacist employed in the pharmacy was the pharmacy manager. In other words, pharmacy owners aren't really managing the other pharmacist they employ because the other pharmacist is typically the pharmacy manager.

Limitations

This study has several limitations, some of which have been previously mentioned. The following section describes the study limitations in regard to study design, data collection methods, and generalizability of findings.

Study Design and Data Collection Methods

The first limitation of this study is the research design. It was a cross-sectional descriptive study that utilized a 6-page questionnaire to collect data from independently-owned community pharmacy managers/owners who served as key informants for their pharmacies. Additionally, this study was the first known study that utilized cross-sectional performance data to calculate a global pharmacy performance score based on the CMS adopted star rating measures. Because a cross-sectional study design was utilized, no conclusions about cause and effect relationships between the independent and dependent variables can be inferred.

The second limitation of this study is related to the quality of the questionnaire data utilized in this study. Pharmacy owners/managers served as key informants for their pharmacies. Therefore, data collected from the key informants about their organizations may only reflect the perceptions of the individual and not the pharmacy as a whole. Additionally, pharmacy managers/owners were asked to self-report their own leadership using the MLQ5X. Although all participants were ensured that their responses would not be linked to them or their pharmacies in any way, this may have led pharmacy owners/managers to respond to the questionnaire items about leadership in a socially desirable manner. As with any self-reported questionnaire, there is risk of social desirability bias. Since the focus of this study was on quality improvement in community pharmacies and all respondents were required to sign an informed consent allowing the principal investigator to access their pharmacy data via EQuIPP, it is reasonable to believe

that respondents may have thought the researcher wanted them to indicate more positive responses to questions about EQuIPP or their attitudes toward quality improvement in pharmacies. This could have caused the respondents to answer in a way that did not accurately reflect their true feelings about quality improvement in community pharmacies.

Going along with the second limitation of this study, the third limitation of this study was the low response rate. Significant efforts were taken to achieve a high response rate that included the use of a modified Dillman method for questionnaire dissemination and the use of a lottery incentive for participation. Additionally, between the 3rd and 4th mailings, an IRB modification request was approved that allowed a telephone contact to determine if the previous mailings had been successfully delivered and to remind non-respondent pharmacies to participate. Despite these efforts, only 90 independently-owned community pharmacies out of a potential 338 returned their completed questionnaires with signed informed consent. This resulted in a final response rate of 26.6%. A low response rate can decrease the power of statistical tests which leads to an inability to detect small differences. The low response rate should be considered when interpreting the relationships that were found to statistically significant as well as those that were not.

The fourth limitation of this study is related to the pharmacy performance data utilized in this study. Pharmacy performance data was provided by Pharmacy Quality Solutions and CECity for 4 months between June 2014 and June 2015. Because these months were not consecutive, an average performance utilizing all 4 months of data was not possible. Instead, one month of data that was collected at a time similar to that of the questionnaire data was utilized to calculate global performance. Although performance does not vary greatly from month to month, average performance over a year's time may be more telling and may have yielded different results.

Additionally, pharmacy performance was calculated using prescription claims data from a particular group of plans. Therefore, individuals who frequently visit the respondent pharmacies but are not insured by one of these plans are not represented in the calculation of pharmacy performance on the star rating measures.

Generalizability

A random sample of independently-owned community pharmacies in Alabama was utilized for this study. First, Alabama was selected as the study state because the southeastern region of the U.S. has been recognized as the poorest performing region in the country. Second, a random sample of independently-owned community pharmacies in Alabama was selected. Third, a pharmacy owner or manager was requested to respond to the questionnaire. Because of these steps, this sample may not accurately represent the population of independently-owned community pharmacies and will not represent the population of community pharmacies as a whole. Therefore, generalizing the findings of this study to other pharmacy ownership types and other states should be done with caution.

Nonresponse bias was of particular concern due to the low response rate. Nonresponse bias analysis using Wave Analysis in which the first 20% of respondents were compared to the last 20% of respondents was conducted. There were no statistically significant differences between early and late responders and therefore, nonresponse bias did not appear to be a problem. Also related to the low response rate was the lack of sufficient sample size to obtain the desired power for statistical tests. As previously stated, this should be considered when interpreting both significant and non-significant relationships between variables as a larger sample size may have resulted in different results.

Implications

This study is the first known study to investigate factors associated with performance using a global pharmacy performance measure. As stated in chapter 1 of this dissertation, this study makes contributions to three important areas: patient outcomes and public health, pharmacy education and policy, and organizational research in pharmacy.

Patient Outcomes and Public Health

This study investigated the factors associated with pharmacy performance which included the offering of quality improvement-related initiatives and the use of EQuIPP. Phase II results of this study suggest that the number of services offered or simply using EQuIPP do not have a significant relationship with pharmacy performance but Phase I results suggested otherwise. High performing pharmacies in Phase I all indicated offering a variety of services but also indicated that they had very personal relationships with their patients. This intangible factor may be what ensures optimal patient outcomes for their patients. Pharmacy professional associations, pharmacy schools, public health agencies, and other healthcare settings should encourage pharmacists to have meaningful relationships with their patients and, despite not being significantly associated with performance, they should encourage pharmacy owners and managers to implement initiatives that have been shown to significantly improve patient outcomes. Improving pharmacy performance on the star rating measures should, in turn, help to reduce wasteful spending due to medication adherence and medication safety issues and improve patient outcomes.

Pharmacy Education and Policy

This study identified the need for additional pharmacist education about performance measures and the quality improvement-related initiatives that can be offered in community

pharmacies. In this study, knowledge was shown to have an association with the offering of pharmacy quality improvement-related initiatives and therefore, it is possible that the more pharmacists and pharmacy owners/managers know, the more initiatives they are willing to offer in an attempt to improve. Pharmacy associations, pharmacy schools, and State Boards of Pharmacy should communicate the importance of pharmacy performance on the star rating measures. This is important so that pharmacies do not miss out on the benefits of being a high performer, some of which have already been implemented. For example, in phase I of this study, it was discovered that many of the pharmacy owners interviewed were unaware that there was a plan currently offering bonus payments to pharmacies that performed at a high level. This could lead to pharmacies missing out on thousands of dollars simply because they lack necessary information.

Organizational Research in Pharmacy

This study was the first known study to investigate factors associated with pharmacy performance on the CMS adopted star rating measures utilizing a global pharmacy performance measure. An extensive review of previously published literature yielded no studies that attempted to determine factors associated with organizational performance on star ratings or for that matter, no studies that attempted to establish a global pharmacy performance metric. This study suggests that organizational factors, such as the offering of quality improvement-related initiatives, may be related to organizational outcomes. Research on organizational factors may help to provide a more comprehensive understanding of organizational performance as opposed to the more frequently studied individual outcomes.

This is also the first known study to investigate organizational leadership and its impact on pharmacy performance. Although many think transformational leadership would be most

effective at improving the quality of care in healthcare organization (Firth-Cozens & Mowbray, 2001), this study did not support that claim in independently-owned community pharmacies. . The interaction effect of leadership type between the independent variables and performance was not significant. These findings may help encourage future research in this area.

Future Directions

Findings from this study raise important questions that need to be addressed in future research. The following areas would benefit from further research.

First and foremost, qualitative research that investigates the differences between high and low performing pharmacies is needed. The activities that occur in organizations are extremely complex and there are numerous factors that can't be controlled. In this study, qualitative interviews with high performing pharmacy owners were conducted in Phase I to identify their perceptions and how they implement quality improvement-related initiatives. Future research could conduct a similar study with both low and high performers so that differences between the two groups could be recognized. Perhaps including both low and high performers could help identify factors that differentiate them, which the current study failed to do. In addition, it might also be valuable to observe interactions in pharmacies in order to provide a more in-depth assessment of how they interact with their patients, how they implement quality improvement-related initiatives, and how leaders work with their subordinates..

Second, future research should be conducted to look at how quality improvement-related initiatives are offered in community pharmacies. This study failed to recognize a significant relationship between the offering of quality improvement-related initiatives and performance on the star rating measures. One potential reason for this was the equal weights given to each pharmacy quality improvement-related initiatives. This method of measurement may not be

sufficient since the implementation of these initiatives does not necessarily mean they are being offered correctly or to the people who need them most. Research that investigates how different initiatives are offered, who they are offered to, and the impact of the initiatives on pharmacy performance would be beneficial to identify which quality improvement-related initiative are indeed associated with performance. This may also identify areas for pharmacist education programs that can help to ensure that pharmacy quality improvement-related initiatives are not implemented superficially and that pharmacy organizations and their patients get the most of these initiatives.

Third, future research that takes into consideration the other pharmacy ownership types is needed to get a better understanding of the pharmacy quality improvement landscape as a whole. In this study, chain, supermarket, and mass merchandiser pharmacies were not included because of the focus on leadership and the decision making ability of pharmacy owners. It would be beneficial to conduct research with different types of pharmacies. Conducting leadership research in corporately owned pharmacies could be informative as it may require including multiple leaders with varying levels of responsibility (i.e., store-level, district-level, etc.).

Fourth, it would be beneficial to test alternative models utilizing the same constructs. For this study, it was hypothesized that leadership would be a moderator in the relationship between the offering of quality improvement-related initiatives and global pharmacy performance. Perhaps placing leadership as a moderator between predisposing factors and the offering of quality improvement-related initiatives or even as a mediator between the two previous mentioned constructs would yield significant results. Although there was support for placing leadership in the model where it was placed, the argument can be made that leadership may actually have an impact earlier in the model. Future research that investigates the relationships

between variables with leadership in different places in the model is needed to identify how early on leadership makes and impact and the significance of that impact.

Conclusions

This study was the first known study to investigate factors associated with pharmacy performance on the CMS adopted star rating measures. This study makes an important contribution to the literature because it provides a great example of how little we know about pharmacy performance and the factors that impact an organizations performance. This study identified statistically significant relationships between knowledge of the pharmacy performance measures and the offering of quality improvement-related initiatives. It also identified attitude towards the star ratings increased the likelihood of the use of the EQuIPP platform while attitude towards the pharmacist's role in improving the pharmacy performance scores decreased the likelihood of the use of the EQuIPP platform. Further research is needed to identify factors that are associated with pharmacy performance.

References

Academy of Managed Care Pharmacy (Producer). (2010, July 20 2014). A Guide Toward Quality. Retrieved from http://www.amcp.org/WorkArea/DownloadAsset.aspx?id=9272

Academy of Managed Care Pharmacy, & American Pharmacists Association. (2014). Medicare star ratings: stakeholder proceedings on community pharmacy and managed care partnerships in quality. *Journal of the American Pharmacists Association : JAPhA, 54*(3), 228-240. doi: 10.1331/JAPhA.2014.13180

Alimo-Metcalfe, B., & Alban-Metcalfe, R. J. (2001). The development of a new transformational leadership questionnaire. *Journal of Occupational and Organizational Psychology, 74*(1), 1-27.

American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. (2012). [Review]. *Journal of the American Geriatrics Society, 60*(4), 616-631. doi: 10.1111/j.1532-5415.2012.03923.x

American Pharmacists Association, & National Association of Chain Drug Stores Foundation. (2008). Medication therapy management in pharmacy practice: core elements of an MTM service model (version 2.0). *Journal of the American Pharmacists Association, 48*(3), 341-353.

Arauz-Pacheco, C., Parrott, M. A., & Raskin, P. (2004). Hypertension management in adults with diabetes. *Diabetes care, 27 Suppl 1*, S65-67.

Armstrong, J. S., & Overton, T. S. (1977). Estimating Nonresponse Bias in Mail Surveys. *JMR, Journal of Marketing Research (pre-1986), 14*(3), 396.

Ascione, F. J., Brown, G. H., & Kirking, D. M. (1985). Evaluation of a medication refill reminder system for a community pharmacy. *Patient education and counseling, 7*(2), 157-165.

Avolio, B. J., Bass, B. M., & Jung, D. I. (1999). Re-examining the components of transformational and transactional leadership using the Multifactor Leadership Questionnaire. *Journal of Occupational and Organizational Psychology, 72*, 441–462.

Avolio, B. J., Waldman, D. A., & Yammarino, F. J. (1991). The four I's of transformational leadership. *Journal of European Industrial Training, 15*(4), 9-16.

Barbuto Jr, J. E., Fritz, S. M., Matkin, G. S., & Marx, D. B. (2007). Effects of gender, education, and age upon leaders' use of influence tactics and full range leadership behaviors. *Sex Roles, 56*(1-2), 71-83.

Barton, A. J., Danek, G., Johns, P., & Coons, M. (1998). Improving Patient Outcomes through CQI: Vascular Access Planning. *Journal of Nursing Care Quality, 13*(2), 77-85.

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations, 61*(8), 1139-1160. doi: 10.1177/0018726708094863

Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York, NY: Free Press.

Bass, B. M., & Avolio, B. J. (1990). *Transformational leadership development : manual for the multifactor leadership questionnaire*. Palo Alto, Calif.: Consulting Psychologists Press.

Bass, B. M., & Bass, R. (2008). *The Bass handbook of leadership : theory, research, and managerial applications* (4th ed.). New York: Free Press.

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership* (2nd ed.). Mahwah, N.J.: L. Erlbaum Associates.

Bates, D. W., Spell, N., Cullen, D. J., Burdick, E., Laird, N., Petersen, L. A., . . . Leape, L. L. (1997). The costs of adverse drug events in hospitalized patients. Adverse Drug Events Prevention Study Group. *JAMA : the journal of the American Medical Association, 277*(4), 307-311.

Behling, O., & McFillen, J. M. (1996). A syncretical model of charismatic/transformational leadership. *Group & Organization Management, 21*(2), 163-191.

Bhalla, R., Schechter, C. B., Strelnick, A. H., Deb, N., Meissner, P., & Currie, B. P. (2013). Pay for Performance Improves Quality Across Demographic Groups. *Quality Management in Healthcare, 22*(3), 199-209 110.1097/QMH.1090b1013e31829a31826b31824f.

Bolman, L. G., & Deal, T. E. (2008). *Reframing organizations : artistry, choice, and leadership* (4th ed.). San Francisco: Jossey-Bass.

Bonner, L. (2015, March 1). Quality metrics, incentives emerging in pharmacy. *Pharmacy Today, 21*.

Boyle, T. A., Ho, C., MacKinnon, N. J., Mahaffey, T., & Taylor, J. M. (2013). Safety Implications of Standardized Continuous Quality Improvement Programs in Community Pharmacy. [Article]. *Journal of Pharmacy Practice, 26*(3), 228-236. doi: 10.1177/0897190012452312

Burke, W. W. (1994). *Leadership assessment inventory* (rev ed.). Pelham, NY: W. Warner Burke and Associates.

Burns, J. M. (1978). *Leadership*. New York: Harper and Row.

Carless, S. (1998). Gender Differences in Transformational Leadership: An Examination of Superior, Leader, and Subordinate Perspectives. *Sex Roles, 39*(11-12), 887-902. doi: 10.1023/a:1018880706172

Carless, S. A., Wearing, A. J., & Mann, L. (2000). A short measure of transformational leadership. *Journal of Business and Psychology, 14*(3), 389-405.

Cattell, R. B. (1966). The scree test for the number of factors *Multivariate Behavioral Research, 1*, 245-276.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, N.J.: L. Erlbaum Associates.

Connor, J., Rafter, N., & Rodgers, A. (2004). Do fixed-dose combination pills or unit-of-use packaging improve adherence? A systematic review. [Review]. *Bulletin of the World Health Organization, 82*(12), 935-939. doi: /S0042-96862004001200010

Cyert, R. M., & March, J. G. (1992). *A behavioral theory of the firm* (2nd ed.). Cambridge, Mass., USA: Blackwell Business.

Díaz-Sáenz, H. R. (2011). Transformational leadership. *The SAGE handbook of leadership*, 299-310.

Dillman, D. A. (2000). *Mail and internet surveys: the tailored design method* (2nd ed.). New York, NY: John Wiley and Sons.

Doucette, W. R., Conklin, M., Mott, D. A., Newland, B., Plake, K. S., & Nau, D. P. (2011). Pharmacy Quality Alliance: Five phase I demonstration projects: descriptions and lessons learned. *Journal of the American Pharmacists Association : JAPhA, 51*(4), 544-550. doi: 10.1331/JAPhA.2011.10100

Drennan, J. (2003). Cognitive interviewing: verbal data in the design and pretesting of questionnaires. [Article]. *Journal of Advanced Nursing, 42*(1), 57-63. doi: 10.1046/j.1365-2648.2003.02579.x

Firth-Cozens, J., & Mowbray, D. (2001). Leadership and the quality of care. *Quality in Health Care, 10*(Suppl II), ii3–ii7.

Gong, Y., Huang, J.-C., & Farh, J.-L. (2009). Employee Learning Orientation, Transformational Leadership, and Employee Creativity: The Mediating Role of Employee Creative Self-Efficacy. *Academy of Management Journal, 52*(4), 765-778. doi: 10.5465/amj.2009.43670890

Gurwitz, J. H., Field, T. S., Avorn, J., McCormick, D., Jain, S., Eckler, M., . . . Bates, D. W. (2000). Incidence and preventability of adverse drug events in nursing homes. *The American journal of medicine, 109*(2), 87-94.

Gurwitz, J. H., Field, T. S., Harrold, L. R., Rothschild, J., Debellis, K., Seger, A. C., . . . Bates, D. W. (2003). Incidence and preventability of adverse drug events among older persons in the ambulatory setting. *JAMA : the journal of the American Medical Association, 289*(9), 1107-1116.

Hanlon, J. T., Schmader, K. E., Koronkowski, M. J., Weinberger, M., Landsman, P. B., Samsa, G. P., & Lewis, I. K. (1997). Adverse drug events in high risk older outpatients. *Journal of the American Geriatrics Society, 45*(8), 945-948.

Harmison, J. H. (2010). Independent Pharmacies Lauded by Patients in J.D. Power and Associates Study Retrieved July 17, 2015, 2015, from http://thehill.com/blogs/congress-blog/healthcare/121107-independent-pharmacies-lauded-by-patients-in-jd-power-and-associates-study

Hayati, D., Charkhabi, M., & Naami, A. (2014). The relationship between transformational leadership and work engagement in governmental hospitals nurses: a survey study. *SpringerPlus, 3*(1), 25.

Health Policy Brief: Pay-for-Performance. (2012). *Health Affairs*.

House, R. J., & Global Leadership and Organizational Behavior Effectiveness Research Program. (2004). *Culture, leadership, and organizations : the GLOBE study of 62 societies*. Thousand Oaks, Calif.: Sage Publications.

IMS Institute for Healthcare Informatics. (2013). Avoidable Costs in U.S. Healthcare: The $200 Billion Opportunity from Using Medicines More Responsibly. In M. Aitken (Ed.). Parsippany, NJ: IMS Institude for Healthcare Informatics.

Indermitte, J., Beutler, M., Bruppacher, R., Meier, C. R., & Hersberger, K. E. (2007). Management of drug-interaction alerts in community pharmacies. *Journal of clinical pharmacy and therapeutics, 32*(2), 133-142. doi: 10.1111/j.1365-2710.2007.00802.x

Inland Empire Health Plan. (2014). Pay For Performance (P4P) Program Retrieved April 14, 2014, from https://ww3.iehp.org/en/providers/pharmaceutical-services/pharmacy-p4p-program

Institute of Medicine (U.S.). Committee on Redesigning Health Insurance Performance Measures Payment and Performance Improvement Programs. (2006). *Performance measurement : accelerating improvement*. Washington, D.C.: National Academies Press.

Institute of Medicine (U.S.). Committee on Redesigning Health Insurance Performance Measures Payment and Performance Improvement Programs. (2007). *Rewarding provider performance : aligning incentives in Medicare*. Washington, DC: National Academies Press.

Iuga, A. O., & McGuire, M. J. (2014). Adherence and health care costs. [Review]. *Risk management and healthcare policy, 7*, 35-44. doi: 10.2147/RMHP.S19801

Jacobson, G., Neuman, T., Damico, A., & Huang, J. (2011). Medicare Advantage Plan Star Ratings and Bonus Payments in 2012. Retrieved April 2014, from The Henry J. Kaiser Family Foundation http://kaiserfamilyfoundation.files.wordpress.com/2013/01/8257.pdf

Kaae, S., Søndergaard, B., Haugbølle, L. S., & Traulsen, J. M. (2011). The relationship between leadership style and provision of the first Danish publicly reimbursed cognitive pharmaceutical service—A qualitative multicase study. *Research in Social and Administrative Pharmacy, 7*(2), 113-121. doi: http://dx.doi.org/10.1016/j.sapharm.2010.03.001

Kaiser Family Foundation. (2012). Costs. *JAMA, 308*(12), 1197-1197. doi: 10.1001/2012.jama.11916

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*, 32-33.

Khan, K. S., Davies, D. A., & Gupta, J. K. (2001). Formative self-assessment using multiple true-false questions on the Internet: feedback according to confidence about correct knowledge. *Medical Teacher, 23*(2), 158-163. doi: doi:10.1080/01421590031075

Kritchevsky, S. B., & Simmons, B. P. (1991). Continuous quality improvement: Concepts and applications for physician care. *JAMA, 266*(13), 1817-1823. doi: 10.1001/jama.1991.03470130097036

Maslach, C., & Leiter, M. P. (2008). Early predictors of job burnout and engagement. *Journal of applied psychology, 93*(3), 498.

McColl-Kennedy, J. R., & Anderson, R. D. (2002). Impact of leadership style and emotions on subordinate performance. *The Leadership Quarterly, 13*(5), 545-559. doi: http://dx.doi.org/10.1016/S1048-9843(02)00143-1

McDonald, H. P., Garg, A. X., & Haynes, R. B. (2002). Interventions to enhance patient adherence to medication prescriptions: scientific review. *JAMA : the journal of the American Medical Association, 288*(22), 2868-2879.

McDonough, R. P., & Doucette, W. R. (2003). Drug therapy management: an empirical report of drug therapy problems, pharmacists' interventions, and results of pharmacists' actions. *Journal of the American Pharmacists Association : JAPhA, 43*(4), 511-518.

McLaughlin, C. P., McLaughlin, C., & Kaluzny, A. D. (2004). *Continuous quality improvement in health care: theory, implementation, and applications*: Jones & Bartlett Learning.

Meterko, M., Young, G. J., White, B., Bokhour, B. G., Burgess, J. F., Jr., Berlowitz, D., . . . Nealon Seibert, M. (2006). Provider attitudes toward pay-for-performance programs: development and validation of a measurement instrument. *Health services research, 41*(5), 1959-1978. doi: 10.1111/j.1475-6773.2006.00582.x

Miller, H. (2012). Overcoming barriers to payment reform. Pittsburgh, PA: Center for Healthcare Quality & Payment Reform.

Morandi, A., Vasilevskis, E., Pandharipande, P. P., Girard, T. D., Solberg, L. M., Neal, E. B., . . . Kripalani, S. (2013). Inappropriate medication prescriptions in elderly adults surviving an intensive care unit hospitalization. *Journal of the American Geriatrics Society, 61*(7), 1128-1134. doi: 10.1111/jgs.12329

Nau, D. (Producer). (2013). Medicare Star Ratings [PowerPoint slides].

Nichols-English, G., & Poirier, S. (2000). Optimizing adherence to pharmaceutical care plans. [Review]. *Journal of the American Pharmaceutical Association, 40*(4), 475-485.

Paine-Andrews, A., Fisher, J. L., Campuzano, M. K., Fawcett, S. B., & Berkley-Patton, J. (2000). Promoting Sustainability of Community Health Initiatives: An Empirical Case Study. *Health Promotion Practice, 1*(3), 248-258. doi: 10.1177/152483990000100311

Pasina, L., Brucato, A. L., Falcone, C., Cucchi, E., Bresciani, A., Sottocorno, M., . . . Nobili, A. (2014). Medication non-adherence among elderly patients newly discharged and receiving polypharmacy. [Research Support, Non-U.S. Gov't]. *Drugs & aging, 31*(4), 283-289. doi: 10.1007/s40266-014-0163-7

Pedhazur, E. J. (2005). *Multiple regression in behavioral research : explanation and prediction*. Fort Worth [u.a.]: Wadsworth/Thomson Learning.

Petrilla, A. A., Benner, J. S., Battleman, D. S., Tierce, J. C., & Hazard, E. H. (2005). Evidence-based interventions to improve patient compliance with antihypertensive and lipid-lowering medications. *International journal of clinical practice, 59*(12), 1441-1451. doi: 10.1111/j.1368-5031.2005.00704.x

Phillips, A. L., Nigro, O., Macolino, K. A., Scarborough, K. C., Doecke, C. J., Angley, M. T., & Shakib, S. (2014). Hospital admissions caused by adverse drug events: an Australian prospective study. *Australian health review : a publication of the Australian Hospital Association, 38*(1), 51-57. doi: 10.1071/AH12027

Podsakoff, P. M., MacKenzie, S. B., & Bommer, W. H. (1996). Transformational Leader Behaviors and Substitutes for Leadership as Determinants of Employee Satisfaction, Commitment, Trust, and Organizational Citizenship Behaviors. [Article]. *Journal of Management, 22*(2), 259.

Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *The Leadership Quarterly, 1*(2), 107-142. doi: http://dx.doi.org/10.1016/1048-9843(90)90009-7

Qato, D. M., & Trivedi, A. N. (2013). Receipt of high risk medications among elderly enrollees in Medicare Advantage plans. *Journal of general internal medicine, 28*(4), 546-553. doi: 10.1007/s11606-012-2244-9

Rafferty, A. E., & Griffin, M. A. (2004). Dimensions of transformational leadership: Conceptual and empirical extensions. *The Leadership Quarterly, 15*(3), 329-354.

Riaz, A., & Haider, M. H. (2010). Role of transformational and transactional leadership on job satisfaction and career satisfaction. *Business and Economic Horizons, 1*(1), 29-38.

Robinson, J. C., Williams, T., & Yanagihara, D. (2009). Measurement of and reward for efficiency In California's pay-for-performance program. *Health affairs, 28*(5), 1438-1447. doi: 10.1377/hlthaff.28.5.1438

Rost, J. C. (1993). Leadership Development in the New Millennium. *Journal of Leadership & Organizational Studies, 1*(1), 91-110. doi: 10.1177/107179199300100109

Saad, A. H., Sweet, B. V., Stumpf, J. L., Gruppen, L., Oh, M., & Stevenson, J. G. (2007). Pharmacist recognition of and adherence to medication-use policies and safety practices. *American Journal of Health-System Pharmacy, 64*(19), 2050-2054.

Spreitzer, G. M., & Mishra, A. K. (1999). Giving Up Control without Losing Control: Trust and its Substitutes' Effects on Managers' Involving Employees in Decision Making. *Group & Organization Management, 24*(2), 155-187. doi: 10.1177/1059601199242003

Svarstad, B. L., Bultman, D. C., & Mount, J. K. (2004). Patient counseling provided in community pharmacies: effects of state regulation, pharmacist age, and busyness. *Journal of the American Pharmacists Association : JAPhA, 44*(1), 22-29.

Thurstone, L. L. (1947). *Multiple factor analysis*. Chicago, IL: University of Chicago Press.

Van Wijk, B. L., Klungel, O. H., Heerdink, E. R., & de Boer, A. (2005). Effectiveness of interventions by community pharmacists to improve patient adherence to chronic medication: a systematic review. *The Annals of pharmacotherapy, 39*(2), 319-328. doi: 10.1345/aph.1E027

Viswanathan, M., Golin, C. E., Jones, C. D., Ashok, M., Blalock, S. J., Wines, R. C. M., . . . Lohr, K. N. (2012). Interventions to Improve Adherence to Self-administered Medications for Chronic Diseases in the United StatesA Systematic Review. *Annals of Internal Medicine, 157*(11), 785-795. doi: 10.7326/0003-4819-157-11-201212040-00538

Viswanathan, M., Kahwati, L. C., Golin, C. E., & et al. (2015). Medication therapy management interventions in outpatient settings: A systematic review and meta-analysis. *JAMA Internal Medicine, 175*(1), 76-87. doi: 10.1001/jamainternmed.2014.5841

Warholak, T. L., & Nau, D. P. (2010). *Quality and safety in pharmacy practice*. New York: McGraw-Hill Medical.

Weberg, D. (2010). Transformational Leadership and Staff Retention: An Evidence Review With Implications for Healthcare Systems. *Nursing Administration Quarterly, 34*(3), 246-258 210.1097/NAQ.1090b1013e3181e70298.

Wilson-Evered, E., Härtel, C. E. J., & Neale, M. A longitudinal study of work group innovation: The importance of transformational leadership and morale *Advances in Health Care Management* (pp. 315-340).

World Health Organization. (2012a). Global Health Expenditure Database (GHED). Retrieved April 14, 2014 http://www.who.int/health-accounts/en/

World Health Organization. (2012b). Life expectancy at birth. Retrieved April 14, 2014 http://gamapserver.who.int/gho/interactive_charts/mbd/life_expectancy/atlas.html

Worley-Louis, M. M., Schommer, J. C., & Finnegan, J. R. (2003). Construct identification and measure development for investigating pharmacist–patient relationships. *Patient Education and Counseling, 51*(3), 229-238.

Yegian, J., & Yanagihara, D. (2013). Value based pay for performance in California. *Integrated Healthcare Association* Retrieved April 14, 2014, from http://www.iha.org/pdfs_documents/p4p_california/Value-Based-Pay-for-Performance-Issue-Brief-September-2013.pdf

Yukl, G. A. (2013). *Leadership in organizations* (8th ed.). Boston: Pearson.

Appendix A: Phase I Recruitment Script

VERBAL CONSENT SCRIPT

Quality Performance in Community Pharmacies: An Exploration of Pharmacists' Perceptions and Predictors – Phase I

Hi, my name is Benjamin Teeter and I am a PhD Candidate in Auburn University's Harrison School of Pharmacy conducting my dissertation research about quality performance in community pharmacies. This study's goal is to identify factors that are associated with high quality care in community pharmacies in an effort to promote these factors and improve patient and public health.

I am contacting you because I would like to get a better understanding of the various services being offered in independently-owned community pharmacies and am interested in pharmacy [*Pick one: owner, manager, key decision maker*]'s thoughts in regards to pharmacy performance measurement.

Participation in this study will involve completing an interview with me in which you will be asked general questions about your pharmacy that address services being offered, awareness and knowledge, and attitudes toward pharmacy performance measurement and star rating measures, and leadership qualities you believe are important in your pharmacy's success. Your involvement will require no more than 30 minutes.

To make sure I have accurate record of the information you provide me, I would like to make a tape recording of our discussion. I will transcribe that recording by hand and will keep the transcripts confidential and securely in my possession. I will erase the tape after I transcribe it.

The risk associated with participation is minimal but there is the potential for breach of confidentiality. I will make every effort to ensure your responses are kept in the strictest confidentiality and I will never link your name or your pharmacy to anything you say in publications or presentations of this study.

Participation in this study is completely voluntary and if you decide not to participate it will not affect your future relationship with Auburn University or the Harrison School of Pharmacy. Additionally, you can decline to respond to a specific interview question or stop participation in the interview at any time.

I will give you my contact information as well as the contact information of the Auburn University Office of Human Subjects Research in case you have any questions concerning this research or your participation in it.

Do you have any questions about this research?

Do you want to participate?

May I record our discussion?

Appendix B: Pre-notification Postcard

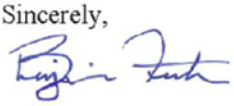
Dear Pharmacy owner or manager,

You are invited to participate in a research study entitled "Quality Performance in Community Pharmacies: An Exploration of Pharmacists' Perceptions and Predictors." Your pharmacy was selected from a pool of independently-owned community pharmacies in Alabama. Information learned from this study may help to improve the quality of care provided in pharmacies.

You will soon receive a questionnaire packet in the mail. The questionnaire should take less than 15 minutes to complete. Your pharmacy does NOT have to participate in quality improvement initiatives to participate. Participants who complete and return the questionnaire will be entered in a raffle for a chance to win 1 of 6 $50 cash prizes.

Please contact me at (334) 844-8314 or teetebs@auburn.edu if you have any questions. Thank you in advance.

Sincerely,



Benjamin Teeter
Principal Investigator, PhD candidate, Department of Health Outcomes Research and Policy

AUBURN UNIVERSITY
HARRISON SCHOOL OF PHARMACY

Health Outcomes Research and Policy
020 James E. Foy Hall
Auburn, AL 36849-5506

Appendix C: IRB Stamped Informed Consent

DEPARTMENT
OF HEALTH OUTCOMES
RESEARCH AND POLICY

AUBURN UNIVERSITY

HARRISON SCHOOL
OF PHARMACY

The Auburn University Institutional Review Board has approved this document for use from 4/21/15 to 4/20/16 Protocol # 15167 EP 1504

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

INFORMED CONSENT
for a Research Study entitled
"Quality Performance in Community Pharmacies: An Exploration of Pharmacists' Perceptions and Predictors"

You are invited to participate in a research study to identify factors that are associated with high quality care in community pharmacies in an effort to promote these factors and improve patient and public health. This study is being conducted by Mr. Benjamin Teeter, PhD candidate under the direction of his advisor, Dr. Salisa Westrick, Associate Professor at Auburn University in the Department of Health Outcomes Research and Policy. Your pharmacy was selected from a pool of independently-owned community pharmacies in Alabama.

What will be involved if you participate? To participate, you will complete the enclosed questionnaire and mail it back to me using the envelope we have provided. Your participation is completely voluntary. If you agree to participate you may choose not to answer any given questions. The questionnaire should take less than 15 minutes to complete. Your participation in this study will also grant me permission to link your responses with your pharmacy performance scores. This will be done using a coding system and therefore, by the time your pharmacy performance scores are linked with your questionnaire responses, both will be completely unidentifiable and neither will be able to be linked back to you or your pharmacy. Your pharmacy performance is calculated and aggregated by Pharmacy Quality Solutions and kept completely confidential. Should you choose to participate, Pharmacy Quality Solutions will share a coded and encrypted file with me that includes the performance scores of your pharmacy. This file will be kept completely confidential, will not be shared with anyone, and will be kept securely in my possession. Collection of your pharmacy's performance scores is necessary to determine which factors are associated with high performance on the star rating measures.

Are there any risks or discomforts? The risks involved in the study are minimal. Data included in study reports will be presented in aggregated form and therefore, neither you nor your pharmacy's identity will ever be disclosed. The questionnaire in this packet has a code number which allows us to monitor responses and follow-up. All codes will be stored in a separate file and kept separate from the completed questionnaires to ensure your responses cannot be linked to you or your pharmacy in any way. Upon completion of the study, all contact information will be destroyed.

Participant's Initials_____

The last page of the questionnaire contains your name and contact information and will be separated from the questionnaire when received. It will be used only for payment purposes and to send you information about the study if requested. It will be destroyed upon study completion.

Are there any benefits to yourself or others? A summary of results will be sent to study participants after data analyses are completed if you indicate your interest in receiving the results. Study results may inform you about the factors that are associated with high performance on the pharmacy metrics being used by the Centers for Medicare and Medicaid Services to evaluate drug plan performance. Further, it may also be helpful to policy-makers, third-party payers, self-insured employers, and other healthcare practitioners as they plan to increase use of these measures.

Will you receive compensation for participating? Participants will not be compensated for participation in the study. However, participants who complete and return the questionnaire will be entered in a lottery for a chance to win 1 of 6 $50 cash prizes. . Odds of winning one of the monetary prizes if all invited individuals participate are 1 in 58.3 but will be better if fewer people participate. If you participate and would like to be entered in the lottery drawing, your name and contact information is requested for payment purposes.

If you change your mind about participating, you can withdraw at any time as long as your response is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or the Department of Health Outcomes Research and Policy.

If you have any questions about this study, please call Mr. Benjamin Teeter or Dr. Salisa Westrick at (334) 844-8314 or email at teetebs@auburn.edu or westrsc@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone at (334) 844-5966 or email at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Benjamin Teeter, MS, PhD Candidate
Principle Investigator

Participant's signature Date

Printed Name

IF YOU WOULD LIKE TO PARTICIPATE, PLEASE INITIAL THE FIRST PAGE, SIGN THIS PAGE, AND RETURN THIS FORM IN THE POSTAGE PAID ENVELOPE WTH YOUR COMPLETED QUESTIONNIARE.

The Auburn University Institutional Review Board has approved this document for use from 4/21/15 to 4/20/16 Protocol # 15-167 EP 1504

DEPARTMENT
OF HEALTH OUTCOMES
RESEARCH AND POLICY

AUBURN UNIVERSITY

HARRISON SCHOOL
OF PHARMACY

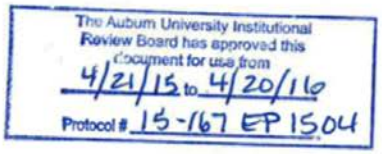
(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

INFORMED CONSENT
for a Research Study entitled
"Quality Performance in Community Pharmacies: An Exploration of Pharmacists' Perceptions and Predictors"

You are invited to participate in a research study to identify factors that are associated with high quality care in community pharmacies in an effort to promote these factors and improve patient and public health. This study is being conducted by Mr. Benjamin Teeter, PhD candidate under the direction of his advisor, Dr. Salisa Westrick, Associate Professor at Auburn University in the Department of Health Outcomes Research and Policy. Your pharmacy was selected from a pool of independently-owned community pharmacies in Alabama.

What will be involved if you participate? To participate, you will complete the enclosed questionnaire and mail it back to me using the envelope we have provided. Your participation is completely voluntary. If you agree to participate you may choose not to answer any given questions. The questionnaire should take less than 15 minutes to complete. Your participation in this study will also grant me permission to link your responses with your pharmacy performance scores. This will be done using a coding system and therefore, by the time your pharmacy performance scores are linked with your questionnaire responses, both will be completely unidentifiable and neither will be able to be linked back to you or your pharmacy. Your pharmacy performance is calculated and aggregated by Pharmacy Quality Solutions and kept completely confidential. Should you choose to participate, Pharmacy Quality Solutions will share a coded and encrypted file with me that includes the performance scores of your pharmacy. This file will be kept completely confidential, will not be shared with anyone, and will be kept securely in my possession. Collection of your pharmacy's performance scores is necessary to determine which factors are associated with high performance on the star rating measures.

Are there any risks or discomforts? The risks involved in the study are minimal. Data included in study reports will be presented in aggregated form and therefore, neither you nor your pharmacy's identity will ever be disclosed. The questionnaire in this packet has a code number which allows us to monitor responses and follow-up. All codes will be stored in a separate file and kept separate from the completed questionnaires to ensure your responses cannot be linked to you or your pharmacy in any way. Upon completion of the study, all contact information will be destroyed.



Participant's Initials_____

The last page of the questionnaire contains your name and contact information and will be separated from the questionnaire when received. It will be used only for payment purposes and to send you information about the study if requested. It will be destroyed upon study completion.

Are there any benefits to yourself or others? A summary of results will be sent to study participants after data analyses are completed if you indicate your interest in receiving the results. Study results may inform you about the factors that are associated with high performance on the pharmacy metrics being used by the Centers for Medicare and Medicaid Services to evaluate drug plan performance. Further, it may also be helpful to policy-makers, third-party payers, self-insured employers, and other healthcare practitioners as they plan to increase use of these measures.

Will you receive compensation for participating? Participants will not be compensated for participation in the study. However, participants who complete and return the questionnaire will be entered in a lottery for a chance to win 1 of 6 $50 cash prizes. . Odds of winning one of the monetary prizes if all invited individuals participate are 1 in 58.3 but will be better if fewer people participate. If you participate and would like to be entered in the lottery drawing, your name and contact information is requested for payment purposes.

If you change your mind about participating, you can withdraw at any time as long as your response is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or the Department of Health Outcomes Research and Policy.

If you have any questions about this study, please call Mr. Benjamin Teeter or Dr. Salisa Westrick at (334) 844-8314 or email at teetebs@auburn.edu or westrsc@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone at (334) 844-5966 or email at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Benjamin Teeter, MS, PhD Candidate
Principle Investigator

Participant's signature Date

Printed Name

The Auburn University Institutional Review Board has approved this document for use from 4/21/15 to 4/20/16 Protocol # 15-167 EP 1504

THIS IS YOUR COPY. PLEASE KEEP IT FOR YOUR RECORDS.

Appendix D: Reminder Telephone Call Script

Quality Performance in Community Pharmacies: An Exploration of Pharmacists' Perceptions and Predictors

Phase II: Telephone Reminder Script

Hello, may I please speak with the pharmacy owner or manager?

Hi! My name is Benjamin Teeter and I am calling from Auburn University. I am a PhD candidate in the department of Health Outcomes Research and Policy in the Harrison School of Pharmacy. I recently sent you a questionnaire as part of my dissertation research and my records show that I have not heard from you. Did you receive the questionnaire?

If NO: I'm sorry! Can I check to make sure I have the right address for your pharmacy? I will send you a new questionnaire packet as soon as possible. If you do not receive it in the next week, would you please let me know? My phone number is (334) 844-8314 or you can email me at teetebs@auburn.edu. Thank you so much for your time!

If YES: Okay, great. I just wanted to call and remind you that it should only take you about 15 minutes to complete and if you fill out and return the questionnaire to me, you will be entered in a raffle for a chance to win 1 of 6 $50 cash prizes. Also, I want to be sure you know that any information I collect will be kept completely confidential and that your responses are important because they represent the views of many pharmacists like yourself and will be used to continue to expand the role of pharmacists in healthcare and improve patient and public health. Thank you for your time and I hope you consider completing and returning the questionnaire!

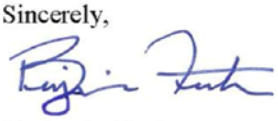
Appendix E: Reminder Postcard

Dear Pharmacy owner or manager,

Last month we sent you a questionnaire about quality performance measures and services offered in your pharmacy. Our records show that we have not heard from you. If you have not gotten to it yet, please take 15 minutes to complete and return the questionnaire. Your responses are important because they represent the views of many pharmacists like yourself and will be used to continue to expand the role of pharmacists in healthcare and improve patient and public health.

If for some reason our records are incorrect and you have already completed and returned the questionnaire, please accept our sincere thanks and contact me by phone or email so that I can try to locate it. Thank you in advance.

Sincerely,



Benjamin Teeter
Principal Investigator and PhD Candidate
P: (334) 844-8314
E: teetebs@auburn.edu

AUBURN UNIVERSITY
HARRISON SCHOOL OF PHARMACY

Health Outcomes Research and Policy
020 James E. Foy Hall
Auburn, AL 36849-5506

Appendix F: Study Questionnaire

Pharmacy Quality Improvement and Performance Measurement Questionnaire

Part I: You and Your Practice Site

Instructions. Tell us about yourself and your practice site by checking ☑ the appropriate boxes.

1.1) Education (check all that apply):
- ❒ B.S. Pharmacy
- ❒ PharmD
- ❒ Residency
- ❒ Masters
- ❒ Other: Specify-_____

1.2) Title (check all that apply)
- ❒ Pharmacy manager
- ❒ Owner/partner
- ❒ Other: Specify-_____

1.3) Gender: ❒ Male ❒ Female

1.4) Number of years you have practiced as a pharmacist: _____

1.5) Number of years you have practiced as a pharmacist at this practice site: _____

1.6) Number of years you have been a pharmacy manager/owner: _____

1.7) Number of years you have been a pharmacy manager/owner at this practice site: _____

1.8) At your practice site:

a. Number of staff pharmacists employed:	_____	Full-time equivalent, 40 hrs/wk (FTEs)
b. Number of technicians employed:	_____	FTEs
c. Total number of employees you are responsible for:	_____	Employees
d. Number of hours **per week** your pharmacy is open:	_____	Hours
e. Average prescription volume **per day**:	_____	Prescriptions
f. Approximate percent of patients who are over 65 years of age:	_____	%

CODE # _____

Part II: Quality Improvement Initiatives

Instructions: Indicate the services that were provided at your practice site in the past 12 months and the approximate percentage of eligible customers/patients (over 65 years of age) who receive/utilize these services by checking (☑) the appropriate boxes.

	Offered in past 12 months	Not offered in past 12 months	If offered in the past 12 months, indicate the approximate percentage of your patients over the age of 65 who received these services by checking the boxes below.			
			1-25%	26-50%	51-75%	76-100%
2.1) Automated telephone reminders to refill prescriptions	❒	❒	❒	❒	❒	❒
2.2) Personal telephone reminders to refill prescriptions	❒	❒	❒	❒	❒	❒
2.3) Medication Therapy Management	❒	❒	❒	❒	❒	❒
2.4) Educational pamphlets or printouts	❒	❒	❒	❒	❒	❒
2.5) Synchronized medication fills	❒	❒	❒	❒	❒	❒
2.6) Blister/bubble packaging	❒	❒	❒	❒	❒	❒
2.7) Appointment Based Models (ABMs)	❒	❒	❒	❒	❒	❒
2.8) Group educational meetings for patients with similar conditions	❒	❒	❒	❒	❒	❒
2.9) Computerized warning systems to avoid drug-drug interactions or high-risk medications	❒	❒	❒	❒	❒	❒
2.10) Other: Please Explain _____ _____	❒	❒	❒	❒	❒	❒

Instructions: The Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP) can be purchased to monitor pharmacy performance and identify areas for improvement. Please tell us about your use of EQuIPP by answering the following questions.

2.11) Does your pharmacy have access to EQuIPP?

❒ Yes ❒ No → **If no, please continue to question 2.22**

2.12) When did your pharmacy gain access to EQuIPP?

_____ (Month/Year)

2.13) Since gaining access to EQuIPP, have you made changes to improve your pharmacy's performance?

❒ Yes ❒ No

2.14) How often do you (or an employee at your pharmacy) check your performance ratings using EQuIPP?

❒ Once a Week ❒ Once every 2 weeks ❒ Once a month ❒ Once every other month ❒ Never

2.15) Which of the following, if any, do you benchmark your performance against? (check all that apply)

❒ Yourself ❒ Other pharmacies in your geographic location ❒ Other pharmacies in Alabama
❒ State Averages ❒ National Averages ❒ CMS required levels

2.16) What do you think are the most helpful features of the EQuIPP platform? (check all that apply)

❒ Access to pharmacy performance scores on quality measures
❒ The *Insight Report* that analyzes performance patterns and identifies competitive position
❒ The improvement strategies and resources provided by EQuIPP
❒ Easy-to-understand presentation of pharmacy scores
❒ Ability to benchmark against pharmacies in your region
❒ Ability to benchmark against your pharmacy's past performance

❒ Other – please specify_____

Instructions. Tell us how much you agree or disagree with the following statements about EQuIPP by checking (☑) the appropriate boxes.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
2.17) I find it easy to get the EQuIPP system to do what I want it to do.	❒	❒	❒	❒	❒
2.18) Using EQuIPP does not require a lot of mental effort.	❒	❒	❒	❒	❒
2.19) I find EQuIPP easy to use.	❒	❒	❒	❒	❒
2.20) I find EQuIPP to be useful.	❒	❒	❒	❒	❒
2.21) Using EQuIPP improves my performance at my job.	❒	❒	❒	❒	❒

2.22) What systems (software, robotics, etc.) and/or services that you provide do you believe contribute to providing high-quality care to your patients?

Part III: Star Rating Measures

Instructions. Tell us whether you think the following statements are TRUE or FALSE and rate your level of confidence in your answer.

	TRUE	FALSE	Not Confident	Somewhat Confident	Confident	Very Confident
3.1) Medicare Part C and D plans, also known as MA-PDs and PDPs, receive star ratings.	❒	❒	❒	❒	❒	❒
3.2) The majority of private practice physicians receive a portion of their payment based on their performance.	❒	❒	❒	❒	❒	❒
3.3) Private health plans are basing a portion of their payment to pharmacies on star rating measure performance.	❒	❒	❒	❒	❒	❒
3.4) Patients can access information on any Medicare Part D plan to see the plan's star rating.	❒	❒	❒	❒	❒	❒
3.5) A plan that receives a 5 star rating can enroll patients at any time during the year.	❒	❒	❒	❒	❒	❒
3.6) Quality bonus payments are paid to plans that perform at a 4 star or higher level.	❒	❒	❒	❒	❒	❒
3.7) Plans that perform at a 3 star level or lower for 3 consecutive years are no longer able to enroll patients through the Medicare website.	❒	❒	❒	❒	❒	❒
3.8) Medication related measures account for approximately 50% of the overall Medicare Part D plan star rating.	❒	❒	❒	❒	❒	❒
3.9) Less than 40% of Medicare Part D contracts for 2014 are rated 4 stars or higher.	❒	❒	❒	❒	❒	❒

Instructions. Tell us your thoughts about the Star Rating Measures adopted by the Centers for Medicare and Medicaid Services by checking (☑) the appropriate boxes.

Statement	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
4.1) The star rating performance measures are tied to meaningful patient outcomes.	❒	❒	❒	❒	❒
4.2) Reaching the thresholds set by CMS for the performance measures is good for my patients.	❒	❒	❒	❒	❒
4.3) I have adequate information about how the star ratings are computed.	❒	❒	❒	❒	❒
4.4) I would not mind having some of my pharmacy's reimbursement tied to our performance.	❒	❒	❒	❒	❒
4.5) The effort required to achieve high performance on the star rating measures will have a negative impact on other areas of my practice.	❒	❒	❒	❒	❒

Statement (continued from the previous page)	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
4.6) Pharmacies are on a level playing field for achieving high ratings.	❒	❒	❒	❒	❒
4.7) The actions necessary to achieve high ratings are largely within my control.	❒	❒	❒	❒	❒
4.8) The methods and data used to evaluate my pharmacy's performance are accurate.	❒	❒	❒	❒	❒
4.9) I believe pharmacists should be responsible for ensuring patients are adherent to their medications.	❒	❒	❒	❒	❒
4.10) I believe pharmacists should attempt to switch elderly patients from high-risk medications.	❒	❒	❒	❒	❒
4.11) I believe pharmacists should attempt to get an ACE inhibitor or ARB prescribed for their patients with diabetes and hypertension who are not taking anything for their hypertension.	❒	❒	❒	❒	❒

Part IV: Leadership

Instructions. Tell us about your leadership style as you perceive it by checking how frequently each of the following statements fit you as a pharmacy owner/manager.

Statement	Not at all	Once in a while	Sometimes	Fairly often	Frequently, if not always
5.1) I provide my employees with assistance in exchange for their efforts.	❒	❒	❒	❒	❒
5.2) I re-examine critical assumptions to question whether they are appropriate.	❒	❒	❒	❒	❒
5.3) I focus attention on irregularities, mistakes, exceptions, and deviations from standards.	❒	❒	❒	❒	❒
5.4) I talk about my most important values and beliefs.	❒	❒	❒	❒	❒
5.5) I seek differing perspectives when solving problems.	❒	❒	❒	❒	❒
5.6) I talk optimistically about the future.	❒	❒	❒	❒	❒
5.7) I instill pride in others for being associated with me.	❒	❒	❒	❒	❒
5.8) I discuss in specific terms who is responsible for achieving performance targets.	❒	❒	❒	❒	❒
5.9) I talk enthusiastically about what needs to be accomplished.	❒	❒	❒	❒	❒
5.10) I specify the importance of having a strong sense of purpose.	❒	❒	❒	❒	❒

Statement (continued from the previous page)	Not at all	Once in a while	Sometimes	Fairly often	Frequently, if not always
5.11) I spend time teaching and coaching.	❒	❒	❒	❒	❒
5.12) I make clear what one can expect to receive when performance goals are achieved.	❒	❒	❒	❒	❒
5.13) I go beyond self-interest for the good of the group.	❒	❒	❒	❒	❒
5.14) I treat employees as individuals rather than just members of the group.	❒	❒	❒	❒	❒
5.15) I act in ways that build others' respect for me.	❒	❒	❒	❒	❒
5.16) I concentrate my full attention on dealing with mistakes, complaints, and failures.	❒	❒	❒	❒	❒
5.17) I consider the moral and ethical consequences of decisions.	❒	❒	❒	❒	❒
5.18) I keep track of all mistakes.	❒	❒	❒	❒	❒
5.19) I display a sense of power and confidence.	❒	❒	❒	❒	❒
5.20) I articulate a compelling vision of the future.	❒	❒	❒	❒	❒
5.21) I direct my attention toward failures to meet standards.	❒	❒	❒	❒	❒
5.22) I consider an individual as having different needs, abilities, and aspirations from others.	❒	❒	❒	❒	❒
5.23) I get others to look at problems from many different angles.	❒	❒	❒	❒	❒
5.24) I help others to develop their strengths.	❒	❒	❒	❒	❒
5.25) I suggest new ways of looking at how to complete assignments.	❒	❒	❒	❒	❒
5.26) I emphasize the importance of having a collective sense of mission.	❒	❒	❒	❒	❒
5.27) I express satisfaction when others meet expectations.	❒	❒	❒	❒	❒
5.28) I express confidence that goals will be achieved.	❒	❒	❒	❒	❒

Part V: Your Information

If you would like to be entered in a raffle for a chance to win one of six **$50 cash prizes**, please write your information below.

Name: _____

Address: _____

_____

1. Would you like us to notify you that we received your completed questionnaire?
   ❒ No ❒ Yes

2. Would you like us to send you the aggregate results of this survey?
   ❒ No ❒ Yes

Please write your email address if you answered "Yes" to at least one of the two questions above:

_____

Thank you very much for your participation in my dissertation research!

Please fold this questionnaire along the dotted line and mail it back to me with the signed informed consent form in the postage paid envelope that was provided in your questionnaire packet.

Appendix G: Correlation Matrix of all Variables Included in the Study

Table G.1
Correlation Matrix of all Variables Included in the Study[a]

	Gender	Years as a pharmacist	Years at this site	years manager/ owner	years manager/ owner at this site	pharmacists employed	technicians employed	number of employees	Number of hours open	Average Rx volume	Awareness	Knowledge	Attitude	Transformational Leadership	Idealized Influence	Inspiration Motivation	Intellectual Stimulation	Individual Consideration	Transactional Leadership	Number of Services Offered	Global Stars
Gender																					
Years as a pharmacist	**-.364****																				
Years at this site	**-.243***	**.710****																			
Years manager/owner	**-.441****	**.818****	**.727****																		
Years manager/owner at this site	**-.351****	**.685****	**.914****	**.841****																	
Pharmacists employed	-.090	.023	.012	-.015	-.046																
Technicians employed	.005	.067	.078	.117	.052	**.560****															
Number of employees	-.114	.107	**.236***	.142	.131	**.513****	**.661****														
Number of hours open	-.152	-.018	.048	-.066	-.035	.181	.112	**.285****													
Average Rx volume	-.148	.008	.175	-.033	.075	**.474****	**.493****	**.634****	**.427****												
Awareness	-.045	.017	.031	-.018	-.038	-.069	.047	.098	.077	.139											
Knowledge	-.077	-.055	-.105	-.048	-.069	-.004	.055	.046	.111	.116	**.211***										
Attitude	-.020	.178	.143	.199	.137	-.087	.037	.013	.011	.106	.121	**.318****									
Transformational Leadership	-.079	.142	.052	.153	.015	.071	-.058	-.009	-.013	-.059	-.016	.137	**.303****								
Idealized Influence	-.123	**.223***	.128	**.210***	.084	.138	-.005	.029	.017	-.006	-.025	.131	**.263***	**.924****							
Inspiration Motivation	-.015	.048	-.024	.038	-.071	.005	-.062	-.008	.007	.039	-.020	**.211***	**.342****	**.874****	**.767****						
Intellectual Stimulation	-.102	.084	.034	.144	.044	.013	-.081	-.014	-.080	-.123	-.050	.125	**.227***	**.820****	**.637****	**.606****					
Individual Consideration	.003	.082	-.008	.104	-.046	.050	-.086	-.071	-.011	-.178	.060	-.039	.201	**.821****	**.676****	**.603****	**.667****				
Transactional Leadership	-.170	.044	-.081	.080	-.028	.045	-.045	-.175	-.187	-.131	-.122	.037	.188	**.697****	**.620****	**.587****	**.644****	**.562****			
Number of Services Offered	-.190	.087	.155	.176	.200	.013	.149	**.235***	.203	.166	-.021	**.372****	**.351****	**.243***	**.220***	**.260***	**.240***	.093	.038		
Global Stars	**.313****	-.003	.060	.083	.077	-.085	.083	-.111	.021	**-.220***	-.166	-.018	.092	.040	.057	-.056	-.015	.173	-.045	.060	

[a]Significant correlations are bolded; *p<0.05; **p<0.01

Appendix H: Evaluation of Attitude Multi-Item Scale

Table H.1 shows the results of Exploratory Factor Analysis using Principle Components Analysis. PCA revealed three components that had eigenvalues greater than one and which explained 34.5%, 14.5%, and 10.7% of the total variance, respectively. Visual inspection of the scree plot indicated that two components should be retained (Cattell, 1966). In addition, a two-component solution met the interpretability criterion. For these reasons, two components were retained.

The two-component solution explained 49.1% of the total variance. A Varimax orthogonal rotation was employed to aid interpretability. The rotated solution exhibited a 'simple structure' (Thurstone, 1947). The interpretation of the two components resulted in defining two different kinds of attitudes toward star ratings: Component 1 had items focused on attitudes toward how the measures are used while Component 2 consisted of the beliefs about the role of the pharmacist in the improvement of star ratings.

Table H.2 summarizes the reliability and summary statistics for the revised Attitude1 and Attitude2 scales. Both scales had acceptable reliability.

Table H.1
Factor Extraction for Attitude Multi-Item Scale[a]

Item	Component	
	1	2
The methods and data used to evaluate my pharmacy's performance are accurate	**.771**	
Pharmacies are on a level playing field for achieving high ratings	**.712**	
Reaching the thresholds set by CMS for the performance measures is good for my patients	**.693**	
The actions necessary to achieve high ratings are largely within my control	**.689**	
The star rating performance measures are tired to meaningful patient outcomes	**.686**	
I would not mind having some of my pharmacy's reimbursement tied to our performance	**.590**	
I have adequate information about how the star ratings are computed	**.539**	
I believe pharmacists should attempt to get an ACE inhibitor or ARB prescribed for their patients with diabetes and hypertension who are not taking anything for their hypertension		**.785**
I believe pharmacists should be responsible for ensuring patients are adherent to their medications		**.688**
I believe pharmacists should attempt to switch elderly patients from high-risk medications		**.637**
The effort required to achieve high performance on the star ratings will have a negative impact on other areas of my practice		**.595**

[a]Major loadings for each item are bolded.

Table H.2
Statistics for Multi-Item Scales for Attitude

Scale	Items	Reliability[a]	Per-Item Mean	Variance
Attitudes1 (N=90)	6/6	.78	1.99	.21
Attitudes 2 N=90	4/4	.73	2.25	.12

[a]Cronbach's Alpha coefficient was used.