A Thesis
entitled
Factors that Influence the Intent of Pharmacists in the Provision of Medication Therapy
Management Services
by
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Submitted to the Graduate Faculty as partial fulfillment of the requirements for the
Master of Science Degree in
Health Outcomes and Socioeconomic Sciences

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May 2018

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Background: Medication therapy management (MTM) is a set of services that have proven to optimize therapeutic outcomes and be extremely beneficial to patients.

However, evidence suggests that pharmacists are not providing MTM services at the rate that they could be. While studies have elucidated on the facilitators and barriers for pharmacists when providing MTM, few have offered a comprehensive explanation that encompasses both physical and psychosocial factors. The Theory of Reasoned Action can be used to assess the attitudes, self-efficacy, and intent of pharmacists in the provision of MTM services (MTMS).

Methods: This is a cross-sectional, survey-based study. The survey contains five sections and 48 items that measure constructs relating to a modified Theory of Reasoned Action (TRA). The survey was administered via the web-based platform Qualtrics. From a list obtained from the Ohio State Board of Pharmacy, 12,140 registered pharmacists were emailed the electronic survey. Descriptive statistics will be used and composite scores will be calculated for the constructs in the TRA. Pearson's correlations and binary logistic regression analyses will be done to address the third

objective. Lastly, a qualitative analysis was conducted for three open-ended survey questions.

Results: A total of 487 responses were retained for analysis. The majority of participants had positive attitudes (71.4%), subjective norm (60.3%), and self-efficacy (75.2%) toward the provision of MTMS. Of MTMS providers, most intended to continue providing MTMS (91.3%). A lesser percentage (40.6%), intended to provide additional MTMS to their current selection of services. Of non-MTMS, only 30.0% intended to begin providing such services. All TRA constructs were found to relate to each other among MTMS providers and a supporting supervisor ($p=0.010$), easy billing ($p=0.032$), and high confidence ($p=0.21$) were predictive of intention. Qualitative analyses identified that many participants consider time, access to a billing platform, training materials, and managerial support as the main facilitators for the provision of MTMS. Lack of time, inadequate staff, and lack of managerial support were identified as the main barriers.

Conclusion: Managerial support and self-efficacy is vital to the successful incorporation of MTMS in pharmacy practice. To cement the value of pharmacist-provided MTM to administration, its financial value must be proven. Providers' status is key to address this. Additionally, pharmacists must be well-equipped and trained to effectively provide MTMS when providers' status is granted to be able to quickly transition into a more clinical role. Access to MTM-specific training materials in the pharmacy can help better equip pharmacists to provide these services.

I dedicate this thesis to my mother and sister, whose support has been unwavering and whose love has been unconditional.

Acknowledgements

I would like to acknowledge the support and guidance of my committee members, Dr. Pinto, Mrs. Puffer, and Dr. Khuder, without which I may not have successfully completed my first independent research project. Additionally, I would like to express my sincere gratitude for my family in the Pharmaceutical Care and Outcomes Research (PCOR) laboratory—Andrew, Matt, Kemi, and Becca. Their support, personally and professionally, has made this experience extra rewarding. Lastly, I would like to thank my PharmD squad for helping me cross the finish line of this exhausting educational marathon.

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List of Abbreviations

CMR.....	Comprehensive Medication Review
CMS	Centers for Medicare and Medicaid Services
DSM.....	Disease State Management
MAP	Medication Action Plan
MTMS.....	Medication Therapy Management Services
PMR.....	Personalized Medication Review
TRA.....	Theory of Reasoned Action

Chapter 1

Introduction

1.1 Background

Medication therapy management (MTM) was defined in 2004 as “a distinct service or group of services that optimize therapeutic outcomes for individual patients”.¹ There are five core elements to MTM, but the concept can be expanded to encompass a multitude of services—comprehensive medication reviews, disease state management, immunizations, health and wellness screenings, etc.^{2,3} MTM encourages the collaboration of healthcare professionals and ultimately reduces health related costs.³ Overall, MTM is proven to be an extremely advantageous health intervention that, when performed by pharmacists, can positively impact the health of patients.^{4,5} Unfortunately, the provision of MTM services has not been optimized.

Since the early 1990s, the need for MTM has only grown. There is an increase in patients with chronic conditions and those taking multiple medications.⁶ Also, total health spending is continuing to rise.⁶ MTM can address these issues. However, a study published by the American Pharmacists Associations revealed that only 50% of eligible patients are receiving MTM from pharmacists.⁷ Additionally, of the five core elements of MTM, comprehensive medication reviews have a lower percentage of utilization.⁷

This is supported by the 2015 and 2016 OutcomesMTM reports, that show a decrease in the number of CMRs being performed.^{8,9} This trend does not align with the current push for the provision of quality care within the healthcare system. This push has been precipitated by the star rating system established by the Centers for Medicare and Medicaid Services (CMS) and provisions within the Affordable Care Act (ACA).¹⁰ Pharmacists are now encouraged to meet various quality measures, one of which is the completion of comprehensive medication reviews.¹¹ However, there are a number of challenges that hinder the effective provision of MTM services.

Historically, barriers for providing these services included: competency concerns regarding the ability to provide clinical services, lack of training on how to provide MTMS, billing, limited space to provide MTMS, and lack of time.¹²⁻¹⁴ However, with the expansion of pharmacists' education to a doctoral program, available training to address billing concerns, dedicated space for patient-pharmacist interactions, and an overall change in the culture of community pharmacy, the ability of community pharmacists to provide MTMS has grown. Currently, the most heavily cited barrier has been lack of time.^{13,14} Pharmacists must balance their dispensing and clinical responsibilities. Fortunately, central fill pharmacies and the incorporation of robotic technology into the pharmacy have worked to lessen the workload for pharmacists.^{15,16} Although numerous solutions have been proposed to eliminate existing barriers, MTM is still not being optimally provided. When considering additional factors affecting its provision, it would be appropriate to look at the psychosocial influences that affect pharmacists. If pharmacists have an overall negative attitude toward providing MTMS, lack the

confidence to do so or their supervisors do not consider MTM a priority, pharmacists may not be inclined to provide these services to patients.

In addition to pharmacist-level barriers, patient-level barriers exist too. While it is shown that patients perceive value in MTM, the main patient barrier is a lack of interest in receiving MTMS.^{14,17} This lack of interest could be the result of a variety of factors. Patients may feel well-equipped to manage their medications without MTM.¹⁷ Also, they may find it difficult to make time in their schedule for a visit with the pharmacist.¹⁷ Lastly, patients may lack a general knowledge of MTM services and thus not seek them out.¹⁷ While this study will not focus on the patient-level barriers, they are worth noting to fully understanding why eligible patients may not be receiving MTM services.

The Theory of Reasoned Action (TRA) proposes that a main predictor of behavior is a person's behavioral intention.¹⁸ Intention is defined as a person's perceived likelihood of performing a behavior.¹⁸ TRA asserts that intention is influenced by attitudes and subjective norm. Self-efficacy also plays a role in behavioral intention. Self-efficacy refers to a person's judgement of their abilities to perform a behavior. It has been said that self-efficacy determines the initial decision to perform a behavior so it is appropriate to measure its relationship with intention.¹⁸ By modifying TRA to include a self-efficacy measure, a more comprehensive understanding of community pharmacists' intentions can be gained.

Community pharmacy is in a state of transition. To keep in pace with new state and federal legislation that is changing health care delivery, pharmacists must be able to adapt. However, adapting may be difficult with the continued challenges pharmacists face in practice. Ultimately, this study will use a modified version of TRA to assess

community pharmacists' intent to perform MTMS and the various factors that influence behavioral intent.

1.2 Rationale

The need for pharmacist-provided medication therapy management continues to grow. The aging population and increasing health expenditure can benefit from the provision of MTM. Additionally, community pharmacists are now encouraged to meet various quality and outcomes measures. MTM services can allow them to meet these measures. Unfortunately, evidence suggests that pharmacists are not providing MTMS, specifically CMRs that directly relate to the quality measures, to the highest level achievable. While there are many factors motivating pharmacists to provide these services, conversely, many barriers exist which may explain the current evidence. These barriers are physical, social, and psychosocial. The theory of reasoned action can be used to examine all of these factors, facilitators and barriers, influencing community pharmacists.

1.3 Research Goal

To examine the facilitators and barriers affecting the intent of pharmacists in providing medication therapy management services.

1.4 Research Objectives

Primary Objectives:

1. To assess the attitudes, subjective norm*, self-efficacy and intention of pharmacists to providing medication therapy management services.
2. To examine the relationship between attitude, subjective norm, self-efficacy, and intentions of community pharmacists.
3. To identify predictors** of pharmacists' intent to provide medication therapy management services.

* Subjective norm = An important referent that would approve or disapprove of an individual's behavior and the motivation to comply with that referent

** Predictors = attitudes, subjective norm, and self-efficacy

Secondary Objective:

1. To explore pharmacists' reasoning behind their intent to provide MTMS.

1.5 Research Questions

1. What are the attitudes, subjective norm, and self-efficacy of pharmacists towards providing medication therapy management services?
2. What is the relationship between attitudes, subjective norm, self-efficacy and intentions of pharmacists?
3. Do attitudes, subjective norm, and self-efficacy predict intention of pharmacists to provide medication therapy management services to patients?

1.6 Research Hypotheses

1. A positive relationship exists between demographics, attitudes, subjective norm, self-efficacy, and intent to provide MTMS.
2. Subjective norm and self-efficacy predicts intention of pharmacists in the provision of MTMS.

1.7 Significance

This study surveyed pharmacists regarding their intent to provide medication therapy management services. The hope was to gain a better understanding of the factors that influence pharmacists' intent to provide these services. Using the results of this study, interventions can be adopted in pharmacies that are aimed at helping pharmacists change their behavior to further increase the utilization these services. Such interventions should be targeted to address the concerns of pharmacists relating to the provision of medication therapy management. Furthermore, this study may provide a more comprehensive look into the barriers and facilitators to providing these services. Ideally, an increase in the provision of these services would coincide with the push for quality care and promote an environment that is mutually beneficial to both patient and pharmacist.

Chapter 2

Literature Review

This chapter provides an overview of the literature associated with this study. It will be divided into the following sections:

- Pharmaceutical Care in the 1990s
- Medication Therapy Management
- The Theory of Reasoned Action
- Social Cognitive Theory
- Summary

2.1 Pharmaceutical Care in the 1990s

Medication therapy management was officially recognized in 2003, however, aspects of its services were a part of community pharmacy practice since the introduction of pharmaceutical care in 1990. Pharmaceutical care focuses on the provision of drug therapy that improves patients' quality of care through the achievement of specified outcomes.¹⁹ The purpose of this was to ensure patients received the correct medication prescribed to them and that the therapeutic outcomes tied to their medications were

optimized. This concept helped introduce the idea of adding pharmacists to the healthcare team. Only through the collaboration of physicians, pharmacists, and nurses could maximum outcomes be achieved. Pharmaceutical care was a logical step in the progression of the profession and when combined with mandates from federal legislation also passed in 1990, propelled pharmacy practice into a new era.

In 1990, Congress passed the Omnibus Reconciliation Act (OBRA 90).²⁰ The purpose was to improve patient outcomes for Medicaid recipients.²⁰ Although specific to the Medicaid population, OBRA 90 set a standard of care for all patients. This piece of legislation broadens the responsibilities of pharmacists. Until 1990, the main task for pharmacists was to dispense medications. While their dispensing responsibilities did not diminish, pharmacists were now required to offer counseling to patients and perform prospective drug utilization reviews.²⁰ These additional tasks would ideally identify therapy duplications, contraindications, drug interactions, drug abuse, and inappropriate dosing.²⁰ The details of OBRA 90 aligned with the principles of pharmaceutical care in that a more comprehensive approach to care was to be given to patients.

2.1.1 Models of Pharmaceutical Care

One of the first successful models of pharmaceutical care was seen in Asheville, North Carolina. The Asheville Project began in 1997 and invited individual pharmacists to participate in the program that offered disease education, medication counseling, basic eye and foot exams, and blood pressure and glucose monitoring to enrolled patients. Patients enrolled in the program were diagnosed with diabetes, asthma, hypertension, and/or high cholesterol. Participating pharmacists went through 32 hours of training to be able to provide these services successfully. Nearly all expenses were covered by the

payer—medication co-pays, education classes, pharmacists visits, labs, etc.²¹ The services provided improved HbA1c, decreased the number of cardiovascular events, and decreased overall health care costs. Additionally, maintenance of improved clinical outcomes was associated with the long-term provision pharmacist services.²²

Project IMPACT is another notable study that showcases the effectiveness of pharmaceutical care. From 1996-1999, 397 patients with dyslipidemia were enrolled into the two year study.²³ Patients received disease, lifestyle, and adherence related education and management from trained pharmacists working in community-based ambulatory care pharmacy settings. Pharmacists also worked collaboratively with physicians to adjust therapeutic regimens when appropriate. Overall, a significant reduction in all lipid levels was observed.²³ Additionally, participating pharmacists expressed an overall positive attitude regarding the services and their impact on patient outcomes. The successes of Asheville and Project ImPACT paved the way for the implementation of similar programs in traditional community pharmacies while showing the benefits of pharmacist-provided MTM.

2.1.2 Barriers to the Provision of Pharmaceutical Care Overtime

Although the benefits of providing pharmaceutical care can be seen with the above mentioned programs, many barriers hindered pharmacists' ability to effectively provide these services. A 1991 report by the American College of Clinical Pharmacy (ACCP) highlighted the barriers to the provision of these clinical services into community pharmacy. Eight barriers were identified – no structure for providing clinical services, insufficient patient data, ineffective communication with physicians, lack of time and resources, lack of a referral network, insufficient education, limited

funding/reimbursement, and negative pharmacist and physician attitudes surrounding the provision of these services.²⁴ This ACCP report came on the heels of a report published by the Department of Health and Human Services one year prior. The inspector general of the time examined the clinical role of community pharmacists and pushed for its use and for the expansion of training and education for pharmacists.²⁵

As pharmaceutical care began to be incorporated more into practice, various solutions were proposed and implemented to address the initial barriers experienced by pharmacists. Improvements in education have greatly improved pharmacists' ability to effectively offer clinical services. Historically, pharmacists only needed a Bachelor of Science degree. However, this degree did not equip pharmacists with the knowledge necessary to properly perform more clinically-based services. In 2000, the American Council on Pharmaceutical Education decided to accredit only the Doctorate of Pharmacy (Pharm.D.) degree.²⁶ Although there was a transition period, currently all graduating pharmacists must have a Pharm.D. degree to practice. The expansion in education enabled pharmacists to better handle their changing role on the healthcare team and more fruitfully manage patients' healthcare needs.

While not all of the barriers have been eliminated, many have been reduced. Since pharmacists are tasked with balancing their dispensing and clinical responsibilities, lack of time has always been a problem. Fortunately, central fill pharmacies and the incorporation of robotic technology into the pharmacy have worked to lessen the workload for pharmacists.^{27,28} Another big problem is either lack of or limited reimbursement. Fortunately, since 2006, pharmacists have been able to use current procedural terminology (CPT) codes to seek reimbursement for MTM services.²⁹

Unfortunately, aside from the three CPT codes available, the reimbursement structure for pharmacists is highly variable. Unless patients pay out-of-pocket for services received or pharmacies are able to contract with a third-party payer, compensation remain low or nonexistent.

Effective communication between pharmacists and other health professions also has been a barrier. This breakdown in communication may result from a physician resistance to accept the clinical role of pharmacists and a lack of structure regarding referrals. Regarding the submission of therapeutic changes and referrals from pharmacists to physicians, a formal structure for this process has not been established. Typically, pharmacists will submit recommendations via telephone or fax. However, a direct line of communication is not present as calls and faxes are usually prioritized by nurses and office aides that produced frustration for both physicians and pharmacists.³⁰ Regarding physician attitudes towards pharmacist-provided MTM, currently they do perceive it as having value.^{30,31} This change in attitude is likely the result of pharmacists improving their education and proving their effectiveness at MTM and improving outcomes. While many barriers still exist, the substantial strides taken during the early years of pharmaceutical care have helped pharmaceutical care and subsequently, MTM, grow.

2.2 Medication Therapy Management

The first reference of pharmaceutical care as medication therapy management (MTM) was in 2003 with the Medicare Prescription Drug Improvement and Modernization Act (MMA). MMA was established, in part, to accommodate for the

dramatic increase in older Americans, the baby boomer generation. MMA established a voluntary prescription drug coverage program for Medicare beneficiaries through Part D.³² Additionally, MMA required Part D sponsors to establish MTM services designed to reduce adverse drug effects and optimize outcomes for patients with chronic conditions and those taking multiple prescriptions.³² As to who should provide these services, MMA pointed to pharmacists, among others, as potential providers of MTM services. If individual Part D sponsors approved of pharmacist-provided MTM services, pharmacies would be able to receive reimbursement determined by the individual prescription drug plans.³³ Unfortunately, MMA limits this reimbursement for only a select group of Medicare Part D patients. The law focuses solely on targeted beneficiaries and does not offer an effective mechanism for pharmacists to provide MTMS to non-Medicare patients. However, even with its gaps, MMA allows pharmacists to receive recognition as a valuable member of the healthcare team and further distance themselves from the traditional title of dispenser.

2.2.1 Medicare Part D and Star Ratings

The Pharmacy Quality Alliance (PQA) was established in 2006 as a way to develop performance standards for pharmacies and strategies that encourage appropriate medication use.³⁴ Many of the PQA measures have been adopted by the Centers for Medicare and Medicaid Services (CMS). CMS established the Medicare star rating system in 2007.³⁵ Health plans that bill for Medicare Part C or Part D would be evaluated based on various quality measures and be given a rating of one to five stars.³⁶ Plans given a rating of five stars are considered to have well above average quality. There are 15 measures for Part D plans. Pharmacists have the potential to boost star

ratings of plans they are networked with and receive preferred pharmacy network status.³⁵ The benefits pharmacists provide to Part D plans can be seen in the completion of comprehensive medication reviews (CMR) and management of medication adherence to many chronic disease states—diabetes, hypertension, and hyperlipidemia.³⁶ Pharmacists are often in the best position to offer these services to patients and have the skills to do so. This is important for plans because CMR completion rates were included in the Part D star ratings starting January 1, 2016.³⁶ Furthermore, the benefits pharmacies receive from being in a preferred pharmacy network include additional business from a greater number of patients and the security of knowing their status within the network is stable as long as performance is meeting plan standards.³⁵ Since pharmacies are incentivized to continually meet quality measures by health plans it is important for them to know if benchmarks are being reached and develop strategies if there improvement is needed.

2.2.2 The Affordable Care Act

While MMA and the establishment of star ratings helped propel pharmacists' potential contributions to patient care, the Patient Protection and Affordable Care Act (ACA) of 2010 allowed for further pharmacist involvement. The ACA have pushed for the implementation of integrated care models like Accountable Care Organizations (ACOs) to better improve patient care and outcomes through the use of various incentives.³⁷ ACA placed an emphasis on the provision of quality care. ACOs create a network of providers that are responsible for the quality and cost of care provided to Medicare beneficiaries.³⁸ Although not providers, pharmacists' contributions on the health care team has been cited by numerous physician groups especially as they relate to

the management of complex drug regimens.³⁹ In short, ACOs and other integrated care models offer greater opportunities for pharmacist involvement and the provision of medication therapy management.

2.2.3 Types of MTM Services

The official definition of MTM refers to a service or set of services. These services can include: medication therapy reviews, pharmacotherapy consults, disease management coach/support, medication safety surveillance, anticoagulation management, immunizations, health and wellness programs, and various other clinical services.⁴⁰

Although many services that fall under the proverbial MTM umbrella, there are five core elements of MTM that were identified by the American Pharmacists Association and the National Association of Chain Drug Stores – a comprehensive medication therapy review (CMR/MTR), personal medication record (PMR), medication-related action plan (MAP), intervention and/or referral, documentation and follow-up.⁴¹ The core elements are meant to guide pharmacists when delivering MTM to patients. A CMR is conducted between a patient and the pharmacist as a means to collect patient information, assess medication regimens, identify medication related problems, and develop a plan to resolve those problems.⁴¹ A PMR is a detailed list of a patient's medications. The medications can be prescription, nonprescription, herbals, and/or other supplements.⁴¹ The MAP is tool for the patient to use to manage their medications and their progress in bettering their health.⁴¹ If significant medication-related problems arise, the pharmacist can intervene to correct the problem and this could include collaboration with the prescribing physician or other healthcare provider.⁴¹ Once MTMS are delivered to a patient it is crucial that the pharmacist documents the encounter so appropriate billing and reimbursement processes

can be completed. Based on these descriptions, it is evident that any patient using prescription and/or non-prescription medications could potentially benefit from MTM services and the core elements.

2.2.4 The Provision of MTMS

The 2000s brought about changes to how MTM was being provided to patients. In the early 2000s, the main MTM interventions pharmacists were making were medication education and monitoring.⁴² Between 2000 and 2006, a shift occurred between the type of medications and the type of patient that was involved in MTM. Pharmacists went from filing MTM claims associated with acute medication and new drug therapy education to filing claims associated with chronic medications and complex drug regimens.⁴² This shift resulted in an increase in pharmacy reimbursement. Despite its growing presence in pharmacy practice, implementation of MTM program in the pharmacy was a challenge due to a variety of challenges.⁴³ Unfortunately, these challenges continue to persist despite efforts to eliminate them as mentioned above.

Currently, the utilization of and need for MTM in pharmacy is increasing. In 2016, CMS published a report citing 100% of Part D sponsors utilize pharmacists for the delivery of MTM services.⁴⁴ Additionally, a 2014 study published by the American Pharmacists Association (APhA) found that 71% of pharmacists are providing MTMS.⁴⁵ In looking to a specific pharmacy, Walgreens is an excellent model for the effective provision of MTM services within a community pharmacy. They have utilized a multifaceted approach to improving patient adherence and outcomes. Part of their approach includes providing MTM with a focus on new-to-therapy patients.⁴⁶ A 2013

study that spanned six-months reviewed patient adherence and hospitalization rates in 72,410 patients.⁴⁷ The study found that patients experienced a 3% increase in medication adherence and a 2% reduction in hospitalizations.⁴⁷ Additionally, there was a significant decrease in healthcare spending of \$226.07 per patient over the six months.⁴⁷ While Walgreens has lead the way for showing the effectiveness of MTM in the community setting, this level of implementation has not been consistently seen throughout all of community pharmacy practice.

The American Pharmacists Association has published numerous reports that track the progress of MTM across various sectors of the profession. It was found that only 50% of eligible patients are receiving MTM and of the five core elements, CMRs have the lowest percentage of utilization.^{48,49} Fortunately, current trends of relevant barriers and facilitators can be determined from those reports. These barriers include, but are not limited to, lack of time, lack of reimbursement, inadequate support staff, lack of a private space, and limited patient interest.⁴⁸ However, over the past two decades great strides have been taken to address these barriers as mentioned above. In addition to these barriers, there are other factors that negatively affect a pharmacist's ability to provide MTMS. Inadequate or no training for providing MTM, limited past experience with providing MTM, and a difficult and complete billing process all could negatively impact the provision of MTMS.⁴⁸ Facilitators include: reimbursement, increased patient loyalty, better RPh/Provider relationship, better RPh/Patient relationship, professional satisfaction, positive patient outcomes.⁴⁸ In an attempt to create a comprehensive understanding of the provision of MTMS, it would also be appropriate to look at the

psychosocial factors influencing pharmacists. If pharmacists have an overall negative attitude toward providing MTMS, lack the confidence to do so, or their supervisors do not consider MTM a priority, pharmacists may not be inclined to provide these services to patients. It is important to examine the relationship between positive and negative factors influencing community pharmacists only then can a better understanding of their intention to provide MTMS be gained.

2.3 Theory of Reasoned Action

The Theory of Reasoned Action (TRA) describes how behavioral intention can predict the behavior of an individual.⁵⁰ TRA is characterized as an expectancy-value theory. Behavioral intention is influenced by attitudes and subjective norms. Figure 2-1 depicts the relationship between the three constructs of TRA: attitude toward behavior, subjective norm, and behavioral intention. Questionnaires that use TRA can directly and indirectly assess factors that affect intention. Direct measures are more strongly associated with behavioral intention and behavior. This association must be established before the results of indirect measurement are analyzed. Thereafter, the indirect measures are most important to understand what specifically influences behavior.⁵⁰ Ultimately, this theory can be used to explain the decision-making process of individuals.

Figure 2-1: Fishbein's Theory of Reasoned Action Model

2.3.1 Attitude toward Behavior

Fishbein defined attitudes as a person's beliefs about the outcomes associated with performing a behavior.⁵⁰ This construct can be measured directly by asking questions that evaluate the overall positive or negative perception of an individual's performance of a behavior. It can also be measured indirectly when broken up into its two components, behavioral beliefs and outcomes evaluation. Indirect measures of attitude are better used to model interventions designed at changing behavior. If an individual has strong positive beliefs regarding the outcomes associated with performing a behavior, a positive attitude toward the behavior will result.

Pharmacists' attitudes toward MTM have continually changed since its introduction in 1990. During its inception, initial attitudes about pharmacist-provided MTM was poor. Community pharmacy was not viewed as the ideal setting for pharmacists to provide clinical services.¹² As time progressed pharmacists' attitudes were influenced by legislation and the expansion of pharmacists' clinical knowledge.

With new incentives to provide MTMS and a shift to value based care, it is reasonable to reexamine pharmacists' attitudes toward MTM.

2.3.2 Subjective Norm

Subjective norm (SN) is determined by an individual's normative beliefs and motivation to comply with the important referents that approve or disapprove of an individual's behavior.⁵⁰ The combined effect of these component variables influences the strength of an individual's intention to exercise the behavior of interest. This construct too can be measured directly and indirectly. Indirect measures of SN are better used to model interventions designed at changing behavior. A positive SN is the result of an individual who is motivated to meet the expectations of an important referent who would approve of the behavior.

Currently community pharmacy is adapting to new quality metrics that are shaping the provision of MTMS. There are incentives from health plans and CMS to provide these services. They can act as referents that shape the subjective norm of pharmacists. Additionally, the priorities and tasks for pharmacists are largely determined by supervisors and administrators. They too are relevant referents and their influence is important to examine in this study.

2.3.3 Past Uses of TRA

A review of the literature showed that TRA could be applied to many health related behaviors when measuring intention. It has been used to predict preventative health measures (e.g. physical activity, mammogram screenings, and condom usage).⁵¹ Additionally, it has been used for healthcare professionals. In predicting physician and pharmacist behavior, it has been applied to providing disease education, counseling,

documentation, guideline compliance, and more.⁵² Studies show that subjective norm and attitudes accounted for 19-39% of the variance for intention and 28-61% of the variance for predicting the behavior.^{52,53} In a meta-analysis conducted by Hagger et al. the predictive ability of TRA was examined.⁵⁴ A separate analysis was done to examine the influence of self-efficacy on intention and behavior when added to the TRA model. It was found that SE accounted for 9.77% of the variance for intention and 39.27% of the variance for behavior. A study involving health care professionals, details how subjective norm may be the most influential construct of TRA.⁵⁴

2.4 Social Cognitive Theory

The Social Cognitive Theory (SCT) was proposed by Albert Bandura in 1962 and was originally called the Social Learning Theory.⁵⁵ From 1962 to now, many changes have been made to the SCT meant to better understand learning, understanding, and behavior. SCT is composed of three components—behavioral factors, personal cognitive factors, and socioenvironmental factors—that detail the concept of reciprocal determinism.⁵⁵ Behavioral factors, in the context of health, can improve or compromise it.⁵⁵ Personal cognitive factors influence an individual's ability to understand and regulate their behavior.⁵⁵ Socioeconomic factors are perceived by an individual and either promote or condemn a behavior.⁵⁵ All three components are related and changing one affects the others.⁵⁵ However, this is not to say that all components have equal strength as some may have a stronger influence depending on the individual.

Each component within SCT is further detailed with a series of constructs. There are three constructs that determine environmental influences of behavior—observational

learning, normative beliefs, social support, and barriers and opportunities.⁵⁵

Observational learning is equated to influential role models for an individual. Normative beliefs encompass cultural beliefs and their perceived importance. Social support also means perceived encouragement. Behavioral factors, in the context of health, can improve or compromise it. The constructs include behavioral skills—the capability of an individual to perform an action, intentions—the plans to perform an action, and reinforcement and punishment. Personal cognitive factors are constructed by collective efficacy, outcomes expectations, knowledge, and self-efficacy. Collective efficacy is relevant when applied to groups and is the belief that the group is capable of performing a certain action.⁵⁵ The evaluation of an action is outcomes expectations.⁵⁵ Knowledge refers to an individual's understanding of the risks and benefits with enacting a behavior.⁵⁵ The last construct of cognitive factors is explained in the next section.

2.4.1 Self-Efficacy

In 1977, Bandura explained how self-efficacy (SE) plays a role in behavior when he proposed The Social Cognitive Theory. He defined SE as “the conviction that one can successfully execute the behavior required to produce the outcomes”.³² This construct assesses individuals' beliefs about how easy/difficult and behavior is and the controllability associated with doing the behavior. Bandura further declared self-efficacy to be the most important factor for behavior change.⁵⁵ Control is studied using many behavioral theories, but SE approaches this concept by having individuals rate their ability to overcome an obstacle to perform a task.³⁰ By measuring SE in this manner, only internal control is a factor.

An individual's self-efficacy is formed in a variety of ways: 1) past experiences, 2) secondary experiences, 3) social pressure, and 4) emotional arousal.⁵⁵ Past experiences with a task/behavior, whether positive or negative, will indicate the likelihood of an individual to repeat the behavior. One will develop expected outcomes that are associated with performing a behavior based on past experiences that will either increase or decrease their self-efficacy.⁵⁵ Additionally, the experiences of others (secondary experiences) influence self-efficacy. The strength of the secondary experiences is dependent on how influential the person performing the behavior is to the individual.⁵⁵ Social pressure also impacts self-efficacy as either encouragement or discouragement.⁵⁵ Lastly, emotional arousal is linked to an individual's foreseen success or failure about performing a task. Negative emotions lower self-efficacy and vice versa for positive emotions. While all four factors influence self-efficacy, their level of importance is determined by the individual.

When examining the history of MTM and the barriers that have impacted community pharmacists' ability to provide these services – lack of education/training on billing and how to conduct MTM session—it is reasonable to assess self-efficacy for this study. Additionally, observational studies and anecdotal evidence suggests pharmacists generally display a lack of confidence when applying clinical knowledge.⁵⁶ As such, pharmacists are missing the opportunity to efficiently provide MTMS and effectively promote their utilization by patients. If pharmacists still feel that their ability to provide these services is lacking, this construct will identify that.

2.4.2 Past Uses of the Social Cognitive Theory

Social cognitive theory has been used by many researchers and public health professionals to guide individuals to effectively promote positive behavior. Specifically, SCT has been applied to short and long term studies that examine habitual behavior like diet and exercise, as well as, to evaluate addictive behavior in adolescents and adults. Also, it has been applied to health professionals to predict their behavioral intention.^{52,57,58} Additionally, SCT has been applied to both experimental and observation studies. A 2010 randomized trial sought to determine the extent of which social cognitive factors influence smoking cessation in adolescents.⁵⁷ Using telephone counseling a sample of participants, researchers attempted to see the effects of this interventions of the participants' self-efficacy.⁵⁷ Although SCT has many constructs, the researchers chose to focus solely on self-efficacy to predict behavior. Another study published in 2016, evaluated the intentions of pharmacy students to pursue a higher degree in pharmacy practice research.⁵⁹ For this study, researchers used a cross-sectional survey design and focused on the personal cognitive factors of SCT. They explained the cognitive factors using self-efficacy and outcomes expectations as constructs. When considering the past uses of SCT and how researchers have modified its components to fit the needs of their studies, the use of self-efficacy in the study referred to in this document is appropriate.

2.5 Summary

This literature review revealed that while many factors have been studied that impact the provision of medication therapy management services, there is still a gap in

the number of communists providing there services. The theory of reasoned action may offer more insight into this gap in care. TRA offers a more comprehensive understanding of community pharmacists' intent to provide MTMS. Chapter three will provide details on the study design and methods used for the study.

Chapter 3

Methodology

This chapter details the methodology of this study. It is divided into the below sections:

- Study Design
- Theoretical Framework
- Study Population and Sample Size
- Survey Instrument
- Instrument Validity and Reliability
- Instrument Administration
- Data Analysis

3.1 Study Design

This is a cross-sectional, survey-based study that will assess the intent of pharmacists in the provision of medication therapy management services. Pharmacists will be provided with an online survey asking questions that have been developed based on a modified TRA model. The objectives of the study will be answered based on survey

responses. Approval from the Institutional Review Board (IRB) at the University of Toledo was obtained before data collection started. All involved researchers for the study will receive IRB training for human subjects' research.

3.2 Theoretical Framework

The theoretical framework for this study is based on a modified version of the Theory of Reasoned Action (TRA). TRA has three constructs: behavioral intention, attitudes, and subjective norm. However, the construct of self-efficacy has been incorporated modifying the original theory. For this study, behavioral intention was defined as a pharmacist's perceived likelihood of providing MTMS. Attitude was defined as the beliefs of pharmacists towards providing MTMS. Additionally, the beliefs about the expected outcomes of providing MTMS to patients make up attitude. Subjective norm was defined as the beliefs of the important people or organizations in the lives of pharmacists regarding the provision of MTMS. Lastly, self-efficacy was defined as the confidence of pharmacists in providing MTMS.

TRA states that pharmacists' intentions to provide MTMS to patients can be predicted by their attitude, subjective norm, and self-efficacy. For this study, attitude, subjective norm, and self-efficacy could be influenced by demographic information, position in the pharmacy, or the pharmacy setting and conditions. The full model used can be seen in Figure 3-1.

Figure 3-1: Modified Theory of Reasoned Action

3.3 Study Population and Sample Size

The target population for this study is licensed Ohio community pharmacists. No further inclusion criteria will be used for this study. Names and contact information have been obtained for the Ohio State Board of Pharmacy. The Ohio State Board was contacted in August 2017. The email addresses of 12,140 Ohio pharmacists were obtained. Literature backs a response rate of 20% for survey research involving pharmacists.⁶⁰⁻⁶² Unfortunately, electronic surveys result in lower response rates so for this study, a 10% response rate is expected.⁶³ Assuming a nonresponse rate of 90%, a total of 1,214 pharmacists' responses are required to achieve a response rate of 10%. A required sample size of 373 is needed to meet power when assuming a 5% margin of error and a 95% confidence interval.

Inclusion Criteria

- Licensed Ohio pharmacists
- Willing and able to provide answers to survey questions

Exclusion Criteria

- Pharmacists not practicing in the state of Ohio

3.4 Survey Instrument

The survey for this study was created from elicitation interviews and a literature search. Elicitation interviews were conducted with six community pharmacists. The purpose of the elicitation interviews was to identify relevant factors that influence the pharmacists' ability to provide MTMS. Six community pharmacists in the Lucas County, Ohio were approached and participated in elicitation interviews. During the interviews, the pharmacists were asked about 10 questions meant to assess their attitudes, subjective norm, and self-efficacy opinions about provided MTMS. Each interview lasted approximately 10 minutes.

Based on the elicitation interviews, a final survey of 48 items was constructed. Not including demographics, the survey was separated into five sections: 1) attitudes toward providing MTMS, 2) subjective norm, 3) self-efficacy regarding the provision of MTMS, 4) direct measures of TRA constructs, 5) intent to provide MTMS.

Section one consisted of two parts. The first part measured behavior beliefs. It was measured using a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The second part measured outcomes evaluation using a 5-point Likert scale (-2=strongly disagree, -1=disagree, 0=neutral, 1=agree, 2=strongly agree). This section will include survey items that refer to patient outcomes and quality care among a variety of others items. For example, "*Providing MTMS will help my patients achieve positive outcomes*" and "*For me, positive patient outcomes are important*". Section two also consisted of two parts. The first part measured normative

beliefs on a 5-point Likert scale (-2=strongly disagree, -1=disagree, 0=neutral, 1=agree, 2=strongly agree). The second part measured motivation to comply using a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). Example items include: “*My supervisor wants me to provide MTMS*” and “*I care what my supervisor thinks*”.

Sections three and four measure self-efficacy and the direct measures of the TRA constructs. A 5-point Likert scale was used in these sections (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). Examples include: “*For me, having a fully staffed pharmacy makes it easy to provide MTMS*” and “*Most people who are important to me think I should provide MTMS*”. Section five looked at pharmacists’ intent to provide MTMS services and was divided into two parts. The first part was for intent and was measured on a dichotomous scale (1=yes, 0=no). The second part asked pharmacists that responded ‘no’ to the intent items to explain what would be needed for him/her to provide MTMS. Lastly, a demographics section included the following items: age, gender, race, practice setting, years of experience, prescriptions per day filled at participant’s pharmacy, position within the pharmacy, and MTM certification status.

3.5 Instrument Validity and Reliability

Face validity of the survey instrument was established through a thorough review of the existing literature regarding the provision of MTMS. Additionally, content validity was examined by professional pharmacy students and faculty members in the University of Toledo’s College of Pharmacy and Pharmaceutical Sciences Department of Pharmacy Practice. Content validity found a 100% item match and was deemed appropriate for

administration. The survey was tested for construct validity by conducting an exploratory factor analysis using principal component analysis (PCA) with a varimax rotation. The reliability of the survey instrument was determined using Cronbach's alpha. This was done to examine how well the survey items correlated with each other. The Cronbach's alpha score of 0.7 or greater is considered acceptable for a reliable question.⁶⁴

3.5 Instrument Administration

The finalized survey was distributed on November 2, 2017 via the web-based survey system Qualtrics®. The Office of Institutional Research at the University of Toledo will provide use of the Qualtrics® system. An initial email invitation for the survey will be sent to Ohio community pharmacists [Appendix C]. The email contained a cover letter and link to the survey. The purpose of the study, confidentiality assurance, and contact information for the primary researcher was also provided in the invitation email. A total of three reminder emails, one per month, was sent to the pharmacists starting November 2017 [Appendix D-F]. Each reminder email contained an abridged version of the initial email and another link to the survey. The raw data collected by Qualtrics® was imported into SPSS for analysis.

Those who completed the survey were entered into a drawing to receive one of two \$50.00 Visa gift cards. All data obtained for the study was de-identified ensuring participants' contact information could not be linked to their survey responses.

Participants who wished to enter the drawing were directed to a separate survey to input their contact information. The contact information collected from the second survey will

be imported into an Excel spreadsheet and winners will be randomly selected to receive the \$50.00 gift cards.

3.7 Data Analysis

The data was analyzed using IBM SPSS, version 24.0 for Windows. Descriptive statistics were calculated for every survey item and each TRA construct—attitudes, subjective norm, and self-efficacy. This was done to answer objective one. The variables representing each TRA construct will be calculated by combining individual item scores (Appendix B). Pearson correlations were done to examine relationships between TRA constructs and address objective two. A binary logistic regression was done to answer objective three – whether attitudes, subjective norm, or self-efficacy predict intention, whether demographic characteristics predict intention. The dependent variable, intent, was dichotomous (0=no, 1=yes).

Chapter 4

Results

This chapter discusses the analyses performed on the collected data and their results. The chapter is divided into the following sections:

- Validity
- Reliability
- Response Rate
- Demographic Characteristics
- Item Responses
- Correlations between Variables
- Regression Analysis for Predictors of Intent
- Qualitative Analysis

4.1 Validity

A post-hoc principal component analysis (PCA) was run to test the content validity of the survey instrument. This analysis was run on sections one through four which includes all items for attitudes, subjective norm, self-efficacy, and direct measures. The three items for intent were not included in the PCA because the dependent variable,

intent, was dichotomous. Additionally, demographic items were excluded from PCA. Factors were retained for analysis if values were greater than 0.3. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity can be used to determine the appropriateness of running a PCA on a data set. Table 4.1 details the results of KMO and Bartlett's Test. Overall, the KMO measure is .818 which suggests the sample is adequate for PCA. Bartlett's test of sphericity was significant ($p < 0.001$) also indicating a factor analysis is appropriate. Figure 4-1 shows the scree plot generated from this data. It was decided that three components would be extracted.

Table 4.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy		.818
Bartlett's Test of Sphericity	Approx. Chi-Square	3566.465
	df	171
	Sig.	.000

Based on the scree plot (Figure 4-1), all eigenvalues before the fourth factor were retained. A forced extraction was done for factors one through three. Together, all three of these factors accounted for 59.17% of the total variance.

Figure 4-1: Scree Plot

Table 4.2 Principal Component Analysis

Scale	Items ^a	Component ^b			
		Factor 1	Factor 2	Factor 3	Factor 4
Attitudes_1	Providing MTMS will help my patients achieve positive outcomes	.028	.563	.069	.410
	For me, positive patient outcomes are important				
Attitudes_2	Providing MTMS will help my pharmacy get reimbursement	.266	.603	.077	-.163
	For me, reimbursement is important				
Attitudes_3	Providing MTMS will help me form a better relationship with providers	-.068	.572	-.011	.545
	For me, a better relationship with providers is important				
Attitudes_4	Providing MTMS will help me form a better relationship with my patients	-.033	.659	.158	.416
	For me, a better relationship with my patients is important				
Attitudes_5	Providing MTMS will help differentiate my pharmacy from competitors	.147	.792	.037	.008
	For me, differentiation from competitors is important				
Attitudes_6	Providing MTMS will help my patients remain loyal to my pharmacy	.137	.804	.155	.117
	For me, patient loyalty is important				
Subjective Norm_1	Other pharmacists want me to provide MTMS	.445	.085	.071	.392
	I care what other pharmacists think				
Subjective Norm_2	My supervisor/administrators want(s) me to provide MTMS	.676	.045	.105	.217
	I care what my supervisor/administrators think(s)				

Scale	Items ^a	Component ^b			
		Factor 1	Factor 2	Factor 3	Factor 4
Subjective Norm_3	Physicians want me to provide MTMS	.025	.016	-.030	.785
	I care what physicians think				
Subjective Norm_4	Patients want me to provide MTMS	.093	.151	.010	.762
	I care what patients think				
Subjective Norm_5	Payers want me to provide MTMS	.821	.137	-.008	-.023
	I care what payers think				
Subjective Norm_6	Centers for Medicaid and Medicare Services (CMS) want me to provide MTMS	.757	.222	.021	-.112
	I care what CMS thinks				
Self-Efficacy_1	For me, training on how to perform MTMS makes it easy to provide them to patients	.320	.146	.398	.407
Self-Efficacy_2	For me, billing for MTMS is easy	.602	.019	.261	.010
Self-Efficacy_3	For me, the resources I have in the pharmacy make it easy for me to provide MTMS	.528	-.016	.301	.384
Self-Efficacy_4	For me, having a fully staffed pharmacy makes it easy for me to provide MTMS	.151	.104	.836	.161
Self-Efficacy_5	For me, having a light workload makes it easy to provide MTMS	.116	.106	.899	-.037
Self-Efficacy_6	For me, having a lot of time makes it easy to provide MTMS	.108	.099	.868	-.039
Self-Efficacy_7	I feel confident that I can provide MTMS to patients	.417	.132	.295	.427

^a Item scales for Attitude (Behavioral Beliefs x Outcome Evaluation) and Subjective Norm (Normative Beliefs x Motivation to Comply)

^b Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization

Table 4.2 details the PCA done on the data set. There were six items that measured attitudes. All items measuring respondent attitudes loaded into factor 1 at

values above 0.32 and were retained for analysis. Subjective norm was measured by six items. While all items loaded at values above 0.32, two items loaded in factor 1 with most items loading in factor 2. Self-efficacy was measured by seven items that too did not load into one factor. All items were retained for analysis because they are analyzed as individual items and the composite score for each construct will not be used for analysis.

4.2 Reliability

Cronbach's coefficient alpha was used to determine the reliability of the survey instrument. Demographic questions were excluded from reliability testing. From sections 1-5, the constructs measured for reliability include: attitudes, subjective norm, and self-efficacy. Sections 1 and 2 compose the attitudes construct and have a total of 12 items – 6 behavioral beliefs and 6 outcome evaluation items. The six composite items that measure attitudes were calculated using the following formula: (Behavioral Beliefs x Outcomes Evaluation). The reliability for the attitudes section was $r = 0.803$. Sections 3 and 4 compose the subjective norm construct and too have a total of 12 items – 6 normative beliefs and 6 motivation to comply items. The six composite items that measure subjective norm were calculated using the following formula: (Normative Beliefs x Motivation to Comply). The reliability for the subjective norm section was $r = 0.709$. Lastly, section 5 measured the self-efficacy construct and had a total of 7 items. This construct was calculated using a mean composite score of all 7 items. The corresponding reliability was $r = 0.812$.

Table 4.3 Reliability Statistics using Cronbach's Alpha

Construct (Factor)	Cronbach's Alpha	N of items
Attitudes	.803	6
Subjective Norm	.709	6
Self-Efficacy	.812	7

4.3 Response Rate

There were a total of 715 survey responses obtained during the data collection period. After eliminating incomplete surveys, a total of 487 responses were retained and were used for analysis. Using information from the Ohio State Board of Pharmacy, electronic surveys were sent to 12,140 licensed pharmacists leading to a response rate of 5.89%.

4.4 Demographic Characteristics

Table 4.4 details the demographic information of the study population. Most of the respondents were female (55.8%) and between the ages of 26 and 35 (39.4%). Almost half of the respondents are the worked for a chain pharmacy (48.9%). Most respondents either had less than five years' experience (31.8%) or over 25 years (24.6%). A majority of respondents worked at a pharmacy that filled less than 400 prescriptions a day (61.4%). Lastly, while comparable, most respondents were MTM certified (51.7%).

Table 4.4 Demographics

Characteristic	Total (N=487)^a
Age, n (%)	
18-25 years	37 (7.6)
26-35 years	192 (39.4)
36-45 years	89 (18.3)
46-55 years	63 (12.9)

56-65 years	62 (12.7)
>65 years	30 (6.2)
Gender, n (%)	
Male	185 (38.0)
Female	272 (55.8)
Race/Ethnicity	
Caucasian	441 (90.5)
Asian	12 (2.5)
African American	8 (1.6)
Hispanic/Latino	3 (0.6)
American Indian/Alaskan Native	1 (0.2)
Other	3 (0.6)
Main Practice Setting, n (%)	
Chain	204 (48.9)
Mass-Merchandiser	23 (4.7)
Independent	86 (17.6)
Ambulatory Care	74 (15.2)
Hospital	81 (16.6)
Position, n(%)	
Staff Pharmacist	175 (35.9)
Clinical/Specialty Pharmacist	94 (19.3)
Pharmacy Manager	103 (21.1)
Pharmacy Owner	19 (3.9)
Floater	31 (6.4)
Other	52 (10.7)
Years of Experience, n (%)	
<5 years	155 (31.8)
6-10 years	84 (17.2)
11-15 years	38 (7.8)
16-20 years	35 (7.2)
21-25 years	33 (6.8)
>25 years	120 (24.6)
Prescriptions per day, n (%)	
<250	163 (33.5)
250-400	136 (27.9)
401-550	77 (15.8)
551-700	36 (7.4)
>700	40 (8.2)
MTM Certified, n (%)	
Yes	252 (51.7)
No	211 (43.3)

^a Thirteen respondents did not provide demographic information

Table 4.5 details the percentage of survey respondents that are providing the five core MTMS. A majority of respondents provide CMR/MTRs (68.8%), however, it

should be noted that less than half of respondents document MTMS (49.5%).

Personalized medication records, medication action plans, and referrals were not widely provided my survey respondents.

Table 4.5 Core Medication Therapy Management Services

Service	Yes (N=487)	No (N=487)
Comprehensive medication reviews of medication therapy reviews	335 (68.8)	152 (31.2)
Personalized Medication Record	182 (37.4)	305 (62.6)
Medication Action Plan	157 (32.2)	330 (67.8)
Referrals	85 (17.5)	402 (82.5)
Documentation of Services	241 (49.5)	246 (50.5)

n(%)

Table 4.6 details the percentage of survey respondents providing additional MTMS other than the five core elements. Most respondents completed TIPS (57.3%) and provided immunizations (62.8%).

Table 4.6 Additional Medication Therapy Management Services

Service	Yes (N=487)	No (N=487)
Disease State Management (DSM)	155 (31.8)	332 (68.2)
Pharmacotherapy Consults	131 (26.9)	356 (73.1)
TIPS (Outcomes/Mirixa)	279 (57.3)	208 (42.7)
Immunizations	306 (62.8)	181 (37.2)
Health and Wellness Screenings	131 (26.9)	356 (73.1)
N/A	33 (6.8)	454 (93.2)

n(%)

4.5 Item Responses

Table 4.7 details the item responses for sections 1-3. Sections 1 and 2 make up “Attitudes”. Overall, the total mean composite score for attitudes was 31.65 depicting a

positive attitude among survey respondents toward providing MTMS. When individual item composite scores were calculated, respondents believed positive patients outcomes (7.01) and stronger patient-pharmacist relationships (7.17) would be the result of their providing MTMS to patients. Respondents had the least positive attitude toward MTMS and their ability to differentiate their pharmacy from a competitor.

Sections 3 and 4 make up “Subjective Norm”. Overall, the total mean composite score for subjective norm was 15.05 depicting a positive subjective norm among survey respondents. Among specific items, supervisor/administrators were the most influential referents among respondents (4.76). Physicians had the lowest influence on survey respondents’ (0.26). Section 5 details questions for self-efficacy. Overall, respondents do have a slightly higher level of self-efficacy (3.76). Having a fully staffed pharmacy had the most impact on respondents’ confidence in their ability to provide MTMS (4.07). This is followed by having time (4.06) and a light workload (4.00).

Table 4.7 Item Responses-Independent Variables

	Total (N=487)
Attitude, mean±SD^{a,b}	31.65±14.49
Positive Outcomes	7.01±3.20
Reimbursement	4.08±3.85
Provider Relationship	4.33±3.25
Patient Relationship	7.17±3.02
Competitor Differentiation	3.99±3.83
Patient Loyalty	5.23±3.32
Subjective Norm, mean±SD^{a,b}	15.05±14.44
Other Pharmacists	1.89±3.52
Supervisor/Administrator	4.76±4.58
Physicians	0.26±3.45
Patients	1.14±3.83
Payers	3.05±3.59
CMS	4.00±3.59
Self-Efficacy, mean±SD^c	3.76±0.73
Training	3.88±0.94
Billing	3.27±1.14
Resources	3.14±1.17

Self-Efficacy, mean±SD ^c	Total (N=487)
Full Staff	4.07±1.04
Light Workload	4.00±1.04
Time	4.06±1.04
Confidence	3.88±1.07

^a Attitudes and Subjective Norm composite scores range from -72 to +72

^b Individual item composite scores range from -10 to +10 and were calculated as follows: Attitude (Behavioral Beliefs x Outcome Evaluation) and Subjective Norm (Normative Beliefs x Motivation to Comply)

^c Self-efficacy scores range from 1 to 5

Table 4.8 depicts the item responses involving the intent of survey respondents to provide MTMS. The table is divided into respondents who were providing MTMS prior to the survey and those who were not (n=436, n=40) to mimic how respondents were to answer the survey questions. Only respondents who were providing MTMS were to answer the following questions, “*I intend to continue providing MTMS*” and “*I intend to provide other MTMS I am not currently providing.*” A majority of respondents who were currently providing MTMS intended to continue providing MTMS (91.0%). However, only 41.0% intended to provide additional MTMS that they were currently not providing. Of survey respondents who were not currently providing MTMS, 70% did not intend to provide MTMS in the future. This can be explained by a large portion of respondents in a position not defined by the provision of MTMS or not having the resources for provide MTMS (see Table 4.4 and Section 4.8).

Table 4.8 Intent Item Responses – Dependent Variable (N=487)

MTM provider	Item	Yes	No
Yes (n=446)	Intend to continue providing MTMS ^a	406 (91.0)	38 (8.5)
	Intend to provide other MTMS ^b	183 (41.0)	258 (57.8)
No (n=41)	Intend to provide MTMS	14 (30.0)	27 (70.0)

^a Respondents that did not answer = 2 ^b Respondents that did not answer = 5
n(%)

The survey asked respondents questions that directly measured TRA constructs. This was done to compare and validate the results of individual construct item results. Table 4.9 details the item responses. Items were measured on a scale of 1-5. Overall, respondents' mean attitude scores were high with the view that MTMS is beneficial (4.30) and important (4.30) to patients suggesting a positive attitude. The highest mean score for subjective norm was 3.67 for respondents' view that there is an expectation that he/she provide MTMS. Lastly, most respondents had a high mean score for confidence (4.18), but felt that the decision to provide MTMS was not up to them (2.50).

Table 4.9 Item Responses – Direct Measures

Construct	Item	Total (N=487)
Attitudes	Providing MTMS to patients is beneficial	4.29±0.73
	Providing MTMS to patients is important	4.29±0.72
	Providing MTMS to patients is pleasant for me	3.79±1.00
	Providing MTMS to patients is useful	4.13±0.79
	Providing MTMS is fulfilling of me	3.96±0.95
Subjective Norm	Most people who are important to me think I should provide MTMS	3.51±0.94
	I feel social pressure to provide MTMS	2.87±1.09
	There is an expectation that I provide MTMS	3.67±1.13
Self-Efficacy	I am confident that I could MTMS to patients	4.17±0.89
	For me, it is easy to provide MTMS	3.53±1.08
	The decision to provide MTMS is entirely up to me	2.49±1.21

mean±SD

4.6 Correlations between Variables

Pearson's correlations were used to assess the relationships that exist among demographic variables, attitudes, subjective norm, self-efficacy, and intention. Table 4.10 shows the correlation results for respondents who were currently providing MTMS. All TRA constructs were correlated with intention. The strongest correlation with intent to

continue providing MTMS was subjective norm indicating a weak positive relationship ($r=.200$; $p=.001$). For intent to provide additional MTMS, self-efficacy was correlated the highest showing a weak positive relationship ($r=.206$; $p=.017$).

Table 4.10 Pearson's Correlation – Current MTMS providers

	Attitude	Subjective Norm	Self-Efficacy
Attitude	-	-	-
Subjective Norm	.409*	-	-
Self-Efficacy	.358*	.429*	-
Intent ^a	.105**	.160*	.206*
Intent ^b	.187*	.200*	.115**

^a Continued MTMS, ^b Other MTMS

* Significant at $p<0.01$ (2-tailed), ** Significant at $p<0.05$ (2-tailed)

Table 4.11 details the relationships between TRA constructs among non-MTMS providing respondents. Only subjective norm and self-efficacy were significantly correlated with intention. Results show that subjective norm has a moderate positive relationship with intention ($r=.387$; $p=.014$). Self-efficacy too has a moderately positive relationship with intention ($r=.402$; $p=.012$).

Table 4.11 Pearson's Correlation – Non MTMS providers

	Attitude	Subjective Norm	Self-Efficacy
Attitude	-	-	-
Subjective Norm	.213	-	-
Self-Efficacy	.167	.460*	-
Intent	.229	.387**	.402*

* Significant at $p<0.01$ (2-tailed), ** Significant at $p<0.05$ (2-tailed)

4.7 Regression Analysis for Predictors of Intent

Table 4.12 describes the results of a binary logistic regression that examines the effects of the modified TRA constructs related to the prediction of intention to continue providing MTMS. The Hosmer and Lemeshow test showed that the model was a good fit ($p=0.306$). Overall, the model explained 10.9% (Cox and Snell R Square) and 24.9% (Nagelkerke R Square) of the variance for intention. There were 19 predictor variables, of which, supervisors/administrators of the SN construct ($p=0.010$) and billing of the SE construct were identified as significant predictors. For the SN item, the odds ratio was 1.157 indicating that survey respondents with supervisors encouraging the provision of MTMS were almost 1.2 times more likely to intent to continue providing MTMS than those who did not have supportive management. For the SE item, the odds ratio was 1.590 meaning that respondents who were more confident in their ability to bill for MTMS, were more likely to intend to continue providing MTMS.

Table 4.12 Logistic Regression Analysis – Continuation of MTMS (n=487)

Construct	Predictor Variable	β	S.E.	Wald	df	p-value	OR (95% CI)
Attitude	Positive Outcomes	.019	.078	.059	1	.809	1.019 (.875-1.186)
	Reimbursement	-.010	.061	.029	1	.865	.990 (.878-1.115)
	Provider Relationship	-.140	.091	2.354	1	.125	.870 (.728-1.039)
	Patient Relationship	.128	.105	1.500	1	.221	1.137 (.926-1.396)
	Differentiation from Competition	-.073	.080	.836	1	.361	.929 (.794-1.088)
	Patient Loyalty	.097	.096	1.002	1	.317	1.101 (.912-1.331)

Construct	Predictor Variable	β	S.E.	Wald	df	p-value	OR (95% CI)
Subjective Norm	Other pharmacists	-.097	.078	1.577	1	.209	.907 (.779-1.048)
	Supervisor/Administrator	.147	.057	6.646	1	.010	1.158 (1.036-1.295)
	Physicians	.030	.080	.137	1	.711	1.030 (.880-1.206)
	Patients	-.075	.077	.972	1	.324	.927 (.798-1.077)
	Payers	.054	.090	.358	1	.550	1.055 (.885-1.259)
	CMS	-.014	.083	.029	1	.865	.986 (.838-1.160)
Self-Efficacy	Training	.001	.015	.006	1	.939	1.001 (.971-1.032)
	Billing	.505	.215	5.534	1	.019	1.657 (1.088-2.523)
	Resources	.036	.216	.027	1	.869	1.036 (.678-1.583)
	Staff	.089	.306	.085	1	.770	1.094 (.600-1.993)
	Light Workload	-.030	.386	.006	1	.937	.970 (.455-2.068)
	Time	-.047	.307	.023	1	.879	.954 (.523-1.740)
	Confidence	.372	.209	3.168	1	.075	1.451 (.963-2.187)

p<0.05 is significant

Table 4.13 depicts the results of the binary logistic regression run to analyze the effects of the modified TRA on the intent to provide additional MTMS. Overall the model was a good fit (Omnibus Test, $p=0.001$; Hosmer and Lemeshow Test, $p=0.867$). The model explained 10.6% (Cox and Snell R square) and 14.4% (Nagelkerke R squared) of the variance for the dependent variable, intention. Of the 19 independent variables examined in this regression, only confidence, of the self-efficacy items, was identified as

a significant predictor of intent to provide additional MTMS ($p=0.021$). The odds ratio was 1.352 indicating that survey respondents who had more confidence in their ability to offer MTMS were 1.3 times more likely to intent to provide additional MTMS than those with less confidence.

Table 4.13 Logistic Regression Analysis – Adding Other MTMS (n=436)

Construct	Predictor Variable	β	S.E.	Wald	df	p-value	OR (95% CI)
Attitude	Positive Outcomes	.016	.047	.110	1	.740	1.016 (.926-1.115)
	Reimbursement	-.001	.031	.001	1	.974	.999 (.940-1.062)
	Provider Relationship	.069	.044	2.410	1	.121	1.071 (.982-1.169)
	Patient Relationship	-.007	.052	.016	1	.898	.993 (.898-1.099)
	Differentiation from Competition	.038	.038	1.002	1	.317	1.039 (.964-1.120)
	Patient Loyalty	-.026	.049	.271	1	.603	.975 (.885-1.073)
Subjective Norm	Other pharmacists	.028	.037	.594	1	.441	1.029 (.957-1.106)
	Supervisor/Administrator	.022	.032	.487	1	.485	1.022 (.961-1.088)
	Physicians	.004	.039	.013	1	.909	1.004 (.930-1.084)
	Patients	.055	.036	2.252	1	.133	1.056 (.983-1.134)
	Payers	-.048	.046	1.085	1	.298	.953 (.872-1.043)
	CMS	.060	.045	1.812	1	.178	1.062 (.973-1.159)
Self-Efficacy	Training	-.005	.009	.318	1	.573	.995 (.978-1.012)
	Billing	-.005	.108	.002	1	.964	.995 (.805-1.231)
	Resources	-.004	.012	.133	1	.715	.996 (.973-1.019)
	Staff	-.008	.060	.019	1	.891	.992 (.882-1.115)

Construct	Predictor Variable	β	S.E.	Wald	df	p-value	OR (95% CI)
Self-Efficacy	Light Workload	-.044	.173	.065	1	.798	.957 (.682-1.343)
	Time	-.118	.174	.459	1	.498	.889 (.631-1.251)
	Confidence	.292	.129	5.114	1	.024	1.339 (1.040-1.724)

p<0.05 was significant

A binary logistic regression was to be run to examine the effects of the modified TRA constructs on the prediction of intent to provide MTMS. However, due to the small sample size (n=40) and the high number of predictor variables, a Mann-Whitney U Test was performed to assess differences in item responses between those who intended to provide MTMS and those who did not. Of the attitude items, positive outcomes was identified as significant (p=0.017). Of the subjective norm items, other pharmacists and supervisor were significant (p=0.01, p=0.023). Lastly, for the self-efficacy items, resources and light workload were significant (p=0.046, p=0.033). These five predictor variables were retained for a logistic regression. However, none of the independent variables were shown to be significant predictors of intent (p>0.05).

4.8 Qualitative Analysis

Section five focused on the intent construct of the modified TRA model. In addition to the intent questions (item results detailed in Table 4.5.2), three open-ended questions were posed to survey respondents that further evaluate their decision to provide MTMS or not.

4.8.1 Emerging Themes Among Respondents with Positive Intent

There were 190 respondents that specified the specific services they intended to provide. Most respondents stated that they intended to provide CMR (n=53), TIPS (n=40), DSM (n=45), and immunizations (n=46). A lesser pool of respondents mentioned pharmacotherapy consults (n=16), wellness screenings/prevention (n=16), MAP (n=11), documentation (n=11), and medication reconciliation (n=11). It is interesting to note that 25 respondents mentioned MTM as an individual service being provided which does not align with the consensus definition. Additionally, six respondents mentioned CMR and MTM together as services they were providing. While most respondents were providing the MTMS specified at the beginning of the survey, a few notable additions include: medication reconciliation and adherence reviews/packaging.

Many respondents commented that although there is patient benefit to providing MTMS, they highlighted the heavy influence that management and payers have in their likelihood to provide MTMS.

“[Only] services requested by insurance” (staff pharmacist at a chain pharmacy)

“Whatever my employer (large chain pharmacy) ALLOWS me to do” (staff pharmacist at a chain pharmacy)

“I want to provide MTMS to any patient no matter what the payer, but I can’t do that today since pharmacists are not considered providers and not all insurance companies will reimburse for 99605-99607.” (clinical pharmacist in ambulatory care)

Respondents identified dedicated time for MTMS, a billing platform, and training materials as main resources that facilitate their provision of MTMS. Additionally, there was a mix between respondents who have access to reliable drug information resources and those who do not.

“...the biggest most influential resource...is time and staffing as well as manager expectations and priorities. If managers prioritize prescription volume over MTM they often remove necessary resources to make MTM possible” (clinical pharmacist at a chain pharmacy)

“Since my employer believes a pharmacist’s job is to only do things that contribute to the bottom line and not necessarily what is contributing to the wellness of the patient, most of my resources come from reference books and continuing education articles. I am sure when pharmacists can bill an insurance company so that MTM becomes profitable all pharmacists will be inundated with seminars and references materials” (staff pharmacist at a chain pharmacy)

4.8.2 Emerging Themes Among Respondents with Negative Intent

Of the intent questions from section five, respondents were asked to provide details into what was needed to change their intent to provide MTMS from ‘no’ to ‘yes’. There was a total of 152 respondents that answered this survey question. The two main items identified were time (n=52) and staff (n=46) followed closely by support from administration (n=17). Additionally, respondents identified the need for more training materials and drug information resources to effectively deliver/offer MTMS (n=12).

“Better reimbursement, more incentives, more explicit expectations from administration” (clinical pharmacist in ambulatory care)

“‘Permission’ from my employer. They only seem to care about [prescription] count because that is how they get paid” (staff pharmacist at a chain pharmacy)

“Have basic DI references but would need specific MTMS guides and training to facilitate provision of services so can be provided in addition to other daily services: screening, CS monitoring, dispensing, dealing with multiple insurance company requirements, billing, etc” (Relief pharmacist at an independent pharmacy)

Chapter 5

Discussion

This chapter provides a detailed discussion of all study results from Chapter Four.

This chapter is divided into the following sections:

- Use of the Survey Instrument
- Response Rate and Sample Size
- Demographic characteristics of respondents
- Theory of Reasoned Action
- Limitations
- Study Implications

5.1 Use of the Survey Instrument

Prior to survey administration, the survey items were reviewed for content validity and deemed appropriate for administration. Additionally, a Principal Component Analysis (PCA) was conducted to further measure validity and a forced extraction was done. No items loaded below 0.32 which would have prompted their removal from analysis. However, several items from the subjective norm and self-efficacy constructs loaded onto multiple factors. All items were retained for analysis because they were

analyzed separately and not combined into a construct composite score. Overall, the factors were found to account for 59.17% of the data variability. Reliability was also assessed using Cronbach alpha's coefficient. No constructs loaded below 0.5 with all sections scoring 0.70 or higher. Validity and reliability results indicate that this survey instrument may be appropriate for use outside of this current study.

The use of this survey can be done by multiple stakeholders – pharmacy managers, payors, other pharmacists. While the survey items may not pertain to everyone, the survey may be modified to fit the needs of the surveyor since individual items can be analyzed separately. For example, if a pharmacy manager wants to examine the views of his/her employers, the items examining attitudes may be the most appropriate to use.

5.2 Response Rate and Sample Size

The data collection period for this study was from November 2, 2017-January 11, 2018. During this time, a total of 715 responses were obtained. In addition to the relatively long data collection period, there were a variety of measures used to increase the survey response rate. These included reminders emails and the option for participants to enter into a raffle for one of two \$50.00 Visa gift cards. Additionally, the survey was sent via email using the survey platform Qualtrics® which likely yielded a lower response rate when compared to a traditional paper based survey. Overall, the response rate was 5.89% which is does not deviate largely from previous literature that involves surveying pharmacists online.⁶² The goal for this study was to have a 10% response rate which was not met. However, as 487 usable responses were retained and 373 responses

were needed to meet sample size requirements, a sufficient response was achieved for this study.

5.3 Demographic Characteristics of Respondents

The characteristics of study respondents were representative of the American Association of Colleges of Pharmacy's (AACP) national profile of pharmacists.⁶⁵ According to AACP, 52.7% of pharmacists are female with a majority, 85.1%, being white. This aligns with the gender and ethnicity distribution of survey respondents for this study. Medication therapy management services are the traditionally provided providing in a community pharmacy setting. Unsurprisingly, most respondents who were providing MTMS were in the community setting while those not working in that setting did not. When considering the relatively new push for the provision of MTMS, proper training both in pharmacy school and post-graduation are newer and may have only been utilized by newer practicing pharmacists. The MTM Certification program created by the American Pharmacists Association and the American Society of Consultant Pharmacists was created in 2007. For this study, 51.4% of respondents had 10 or less years of experience and about 54.1% of respondents were MTM certified which could be explained by an increased likelihood of younger pharmacists utilizing available MTM training material/programs. Additionally, most respondents reported prescription volume of 400 or less which could be useful in understanding limitations of time detailed later in this chapter. While this study represents the landscape of community pharmacists, it may not be generalizable to all pharmacists as this is limited to just the state of Ohio.

5.4 Theory of Reasoned Action

A modified Theory of Reasoned Action was used as a basis for this study which was explained in detail in chapter 3. This section will be divided into the following sections: 1) Attitudes 2) Subjective Norm 3) Self-Efficacy.

5.4.1 Attitudes

Previous studies have examined the intentions of pharmacists, but they have focused on medication counseling or pharmaceutical care. Only one study, from 2006, examines pharmacists' attitudes toward medication therapy management services and its relationship with intention.⁶⁰ Specifically, it looked at intention to provide MTMS to Medicare beneficiaries and found that most pharmacists had a positive attitude toward MTMS (69.0%). Additional research also supports the idea that pharmacists have a positive attitude toward MTMS as it can improve the quality of patients' care.²³

For this current study, respondents too had a positive attitude toward the provision of MTMS supporting the findings of previous literature. The average score was 71.47% which is comparable to the 2006 study.⁶⁰ Specifically, respondents felt MTMS would result in positive outcomes and improved patient-pharmacist relationships. Attitudes were found to be positively correlated with intention. This means that the stronger the positive attitude the stronger the intent. However, regression analyses did not identify items within the attitude construct as significant predictors of intention. This is unsurprising when examining the responses to the open-ended survey questions. Many respondents mentioned that although MTMS can contribute to the betterment of patient care and outcomes, but too many barriers existed which include inadequate time and staffing that inhibit the effective provision of MTMS. This finding aligns with many

studies that identify time and staffing as a major deterrent to providing MTMS.⁷ Due to the correlation between attitudes and intention, it is likely that the barriers are muting this relationship. Thus, it may be stated that if more time and personnel were available in pharmacies, an increase in the amount of MTMS provided could be seen because pharmacist support for these services already exists.

5.4.2 Subjective Norm

Current literature suggests SN may be the most influential predictor of health professionals' intentions.^{52,61} When comparing the influence of TRA constructs, SN may have a larger impact on behavior. Previous research has identified that SN may be predictive of behavior that affects others.⁶⁶ This current study found that pharmacists associated the provision of MTMS with positive patient outcomes which might explain why SN was identified as a predictor of intent among survey respondents.

In a previous study examining pharmacists' intent to provide MTMS, SN was around 70%.⁶¹ This is a slightly higher percentage than the 60% found in this current study. This could be explained by three lowering scoring items within the SN construct, as well as differences in items measuring SN between these two studies. Although this study's SN score was lower than previous literature, it was still related to intention as detailed by correlation results. When looking specifically at predictor variables within the SN construct, supervisors/administrators had the biggest impact on pharmacists' intention. Many respondents felt that their services were limited to what the administrators deemed important. Moreover, importance was defined by a service's contribution to the 'bottom-line'. The main source of revenue for pharmacies, both chain and independent, is from filling prescriptions.⁶⁷ Currently, pharmacists are not considered

health care providers which negatively impacts the reimbursement that can be received from providing services.⁶⁸ When considering the impact of potential revenue sources, it is understandable that pharmacy administrators may place a focus on dispensing above clinical services like MTM. Reimbursement from dispensing is declining and the provision of clinical services could be the solution.⁶⁹ This study identified that pharmacists are likely to comply with administrator/supervisor instruction, so proving the financial benefit of MTMS to them may increase the provision of these services. However, proving the benefits of MTMS may be a two-step process starting with provider status as a beginning step to increase the reimbursement associated with these services. Once this is done, the priorities of the administrators may change to include more MTMS which will eventually trickle down to individual pharmacists.

5.4.3 Self-Efficacy

There is limited literature on self-efficacy and its relation to pharmacist-provided MTMS when using TRA. However, there is research on perceived behavioral control (PBC), which is a construct in TRA's sister theory—the theory of planned behavior. Both PBC and SE assess the perceived ability to perform a behavior, but PBC considers the impact lack of control over a situation/behavior has on intention.⁷⁰ SE assesses one's ability to perform a behavior to get a desired outcome while focuses solely on internal control.^{30,32} In studies using PBC to assess pharmacists' intent to provide MTMS, pharmacists overall felt that they could provide MTMS to patients and PBC was identified as a significant predictor of intention.⁶⁰

The findings of this study show self-efficacy played a role in intention of current MTM providers. Overall, respondents had a positive level of self-efficacy (75.2%). As it

relates to intention, SE was positively correlated with intent. Additionally, SE was identified as a significant predictor with billing and confidence being the specific items within this construct to be predictors. These specific items, while positive, scored lower among survey respondents. Approximately 50% of respondents were MTM certified which could explain why many respondents stated that they would appreciate more MTM-specific training materials. According to the 2014 report published by the American Association of Colleges of Pharmacies, a third of practicing pharmacists are over the age of 56 meaning their exposure to MTMS has been on the job and not from the pharmacy school curriculum.⁶⁵ Having access to instructional material would be a benefit to all practicing pharmacists, not just those who are older.. The more confident pharmacists are in their ability to provide MTMS, the more likely they may be able to effectively contribute to patient care.

5.5 Limitations

While comprehensive, this study does have several limitations that must be considered when interpreting the results. Firstly, this study only sampled pharmacists from the state of Ohio. As a result, the generalizability is limited. States have different laws that define the role and responsibilities of pharmacists. This difference could result in differences in survey responses. Secondly, the response rate of 5.89% is low. Although sample size requirements were met, due to the large sampling population, a bigger sample size may have increased the analysis' power. Also, no casual inferences can be made based on study results. Another limitation is response bias. Survey items were worded similarly and could have increased the possibility of response bias.

Additionally, this study had a cross-sectional design so any changes in pharmacists' intention could not be measured. Furthermore, behavior was not measured so no definitive interpretation can be made that positive pharmacist intention actual leads to the provision of MTMS.

As it relates to survey content, information that could have lent to the analysis was not included. For example, no specific questions regarding barriers were asked. While many survey items included possible barriers, a specific section pertaining to barriers may have been helpful when interpreting results. Additionally, having respondents define MTMS or providing the consensus definition could have been beneficial. The open-ended questions pointed to the possibility that what is considered an MTMS is different depending on the respondent which could have skewed the interpretation of survey questions. Lastly, the survey instrument is limited in its future use due to its validity results. This study analyzed items separately negating the problems with validity, however, it would not be appropriate to analyze construct composite scores because multiple construct items loaded on different factors.

5.6 Implications

The results of this study have many implications for the profession of pharmacy and its expansion, in addition to the use of TRA to evaluate the intention of pharmacists. There has only been one other study that examines pharmacists' intent to provide MTMS. This study took place over ten years ago and showed positive attitudes and subjective norm.⁶⁰ Specifically, pharmacists felt MTMS would help push the profession forward

and would be highly supported by management.⁶⁰ This previous study was conducted as MTM was finally being recognized as an important set of services for the betterment of patient health. The findings from this current study show that attitudes have remained the same, but support from management has declined resulting in minimal incentive for pharmacists to provide MTMS to patients. This is extremely discouraging as MTMS was meant to bring the profession into a new era. Due to reimbursement issues, the value of clinical services is not high. The findings from this study showing positive attitudes and a high level of confidence for providing MTMS do not hold enough weight to overcome the affects that result from limited reimbursement. Without provider status to open the door to meaningful reimbursement for pharmacies and health systems, pharmacist-provided MTM will never reach its full potential. Without providers status, the profession of pharmacy is at a standstill. Future research into pharmacists' intent to provide MTMS would be warranted when pharmacists are granted the status of provider to assess the changes to attitudes, subjective norm, and self-efficacy

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Appendix A

Survey

While all MTM services are beneficial to patients, please specify the services you are currently providing? (select all that apply)

☐ Comprehensive medication reviews or medication therapy reviews (CMR/MTR)	☐ Tips (Outcomes/Mirixa)
☐ Medication action plan (MAP)	☐ Disease state management
☐ Personalized medication record (PMR)	☐ Immunizations
☐ Documentation of services	☐ Pharmacotherapy consults
☐ Referrals	☐ Health and wellness screenings
☐ Other	

*****Please answer the questions in sections 1-4 based on how you answered the above question*****

Section 1:

Please answer each question by circling the number that best describes your opinion. The articles listed in the left most column are meant to complete the below sentence:

“Providing MTMS will _____”

	BEHAVIOR BELIEFS	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Help my patients achieve positive outcomes	1	2	3	4	5
2	Help my pharmacy get reimbursement	1	2	3	4	5

	BEHAVIOR BELIEFS	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
3	Help me form a better relationship with providers	1	2	3	4	5
4	Help me form a better relationship with my patients	1	2	3	4	5
5	Help differentiate my pharmacy from competitors	1	2	3	4	5
6	Help my patients remain loyal to my pharmacy	1	2	3	4	5

Please answer each question by circling the number that best describes your opinion.

	OUTCOMES EVALUATION	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	For me, positive patient outcomes are important	-2	-1	0	1	2
2	For me, reimbursement is important	-2	-1	0	1	2
3	For me, a better relationship with providers is important	-2	-1	0	1	2
4	For me, a better relationship with my patients is important	-2	-1	0	1	2
5	For me, differentiation from competitors is important	-2	-1	0	1	2
6	For me, patient loyalty is important	-2	-1	0	1	2

Section 2:

Please answer each question by circling the number that best describes your opinion.

	NORMATIVE BELIEFS	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Other pharmacists want me to provide MTMS	-2	-1	0	1	2
2	My supervisor/administrators want(s) me to provide MTMS	-2	-1	0	1	2
3	Physicians want me to provide MTMS	-2	-1	0	1	2
4	Patients want me to provide MTMS	-2	-1	0	1	2

	NORMATIVE BELIEFS	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
5	Payers want me to provide MTMS	-2	-1	0	1	2
6	Centers for Medicaid and Medicare Services want me to provide MTMS	-2	-1	0	1	2

Please answer each question by circling the number that best describes your opinion. The articles listed in the left most column are meant to complete the below sentence:

"I care what _____ think(s)"

	MOTIVATION TO COMPLY	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Other pharmacists	1	2	3	4	5
2	My supervisor/administrators	1	2	3	4	5
3	Physicians	1	2	3	4	5
4	Patients	1	2	3	4	5
5	Payers	1	2	3	4	5
6	Centers for Medicaid and Medicare Services	1	2	3	4	5

Section 3:

Please answer each question by circling the number that best describes your opinion.

	SELF-EFFICACY	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	For me, training on how to perform MTMS makes it easy to provide them to patients	1	2	3	4	5
2	For me, billing for MTMS is easy	1	2	3	4	5
3	For me, the resources I have in the pharmacy make it easy for me to provide MTMS	1	2	3	4	5

	SELF-EFFICACY	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
4	For me, having a fully staffed pharmacy makes it easy for me to provide MTMS	1	2	3	4	5
5	For me, having a light workload makes it easy to provide MTMS	1	2	3	4	5
6	For me, having a lot of time makes it easy to provide MTMS	1	2	3	4	5
7	I feel confident that I can provide MTMS to patients	1	2	3	4	5

Section 4:

Please answer each question by circling the number that best describes your opinion

	DIRECT MEASURES	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Providing MTMS to patients is beneficial	1	2	3	4	5
2	Providing MTMS to patients is important	1	2	3	4	5
3	Providing MTMS to patients is pleasant for me	1	2	3	4	5
4	Providing MTMS to patients is useful	1	2	3	4	5
5	Providing MTMS to patients is fulfilling for me	1	2	3	4	5
6	Most people who are important to me think I should provide MTMS	1	2	3	4	5
7	I feel social pressure to provide MTMS	1	2	3	4	5
8	There is an expectation that I provide MTMS	1	2	3	4	5
9	I am confident that I could provide MTMS to patients	1	2	3	4	5
10	For me, it is easy to provide MTMS	1	2	3	4	5
11	The decision to provide MTMS is entirely up to me	1	2	3	4	5

Section 5:

Please answer each question by circling the number that best describes your opinion

	INTENTION		
1a	I intend to provide MTMS to patients	Yes	No
1b	I intend to continue providing the MTMS I listed in the beginning of this survey	Yes	No
1c	I intend to provide other MTMS that I am not currently providing	Yes	No

2. If you answered “yes” to the above question(s), please specify what specific services you plan to provide?

3. If you answered “yes” to the above question(s), what resources are available to you that motivate you to provide these services?

4. If you answered “no” to the above question(s), please explain what you would need to provide MTMS?

Demographics

What is your age?

- a. 18-25 years old
- b. 26-35 years old
- c. 36-45 years old
- d. 46-55 years old
- e. 56-65 years old
- f. >65 years old

How many years of experience do you have as a practicing pharmacist?

- a. <5 years
- b. 6-10 years
- c. 11-15 years
- d. 16-20 years
- e. 21-25 years
- f. >25 years

What gender do you most identify with?

- a. Male
- b. Female

What race/ethnicity do you most identify with (select one)?

- a. Caucasian
- b. African American
- c. Hispanic/Latino
- d. American Indian/Alaskan Native
- e. Other (write-in) _____

What position do you hold in the pharmacy (select one)?

- a. Staff Pharmacist
- b. Clinical/specialty Pharmacist
- c. Pharmacy Manager
- d. Pharmacy Owner
- e. Floater
- f. Other (write-in) _____

What is your main practice setting (select one)?

- a. Chain pharmacy
- b. Mass-Merchandiser
- c. Independent
- d. Ambulatory Care
- e. Hospital

On average, how many prescriptions does your pharmacy fill each day?

- a. <250
- b. 250-400
- c. 401-550
- d. 551-700
- e. >700

Are you MTM certified?

- a. Yes
- b. No

Appendix B

Survey Scoring

Survey Section	Question Numbers	Response Format	Score Multiplication	Composite Construct Score	Item Composite Score	Construct Measured
Behavioral Beliefs	1a-6a	1 to 5	1a x 1b; 2a x 2b; 3a x 3b; 4a x 4b; 5a x 5b; 6a x 6b	-72 to 72	-10 to 10	Attitudes
Outcomes Evaluation	1b-6b	-2 to 2				
Normative Beliefs	1c-6c	-2 to 2	1c x 1d; 2c x 2d; 3c x 3d; 4c x 4d; 5c x 5d; 6c x 6d;	-72 to 72	-10 to 10	Subjective Norm
Motivation to Comply	1d-6d	1-5				
Self-Efficacy	1-7	1-5	-	Mean Score	Mean score	Self-Efficacy
Intention	1	Yes or No	-	-	0 or 1	Intent
Demographics	1-7	-	-		-	-

Appendix C

Invitation Email

November 2, 2017

Dear Participant,

You are invited to participate in the research study entitled, “Factors that Influence the Intent of Pharmacists in the Provision of Medication Therapy Management Services (MTMS),” originating from the University of Toledo College of Pharmacy and Pharmaceutical Sciences. With the current push for pharmacies and health plans to meet various quality and outcomes metrics, it is important to better understand the opinions and motivations of pharmacists relating to their intent to provide MTM.

I am contacting you because it is my understanding that you are currently a licensed Ohio pharmacist. We are contacting a sample of Ohio pharmacists to ask questions regarding their provision of medication therapy management services.

To participate in this study, please use the link provided to take the online survey. This survey should not take more than 15 minutes. Please complete the entire survey as your responses are very important to achieve meaningful results. Your responses are completely confidential and anonymous. Participation is voluntary, however, to encourage increased involvement, you may choose to be entered into a raffle to win one of two **\$50 Visa gift cards**. A link will be provided at the end of the survey to complete the necessary information for the raffle.

If you have any questions or comments about this study, please do not hesitate to contact me by email (angela.simon@rockets.utoledo.edu) or contact the principal investigator, Dr. Sharrel Pinto (sharrel.pinto@utoledo.edu).

Your contribution is essential to the success of this study, and is wholeheartedly appreciated. Thank you very much for your time.

Sincerely,

A handwritten signature in black ink that reads "Angela M. Simon". The script is cursive and fluid, with the first name "Angela" being more prominent than the last name "Simon".

Angela M. Simon

PharmD/MS Candidate 2018

Graduate Research Assistant

Pharmaceutical Care and Outcomes Research Laboratory

University of Toledo College of Pharmacy and Pharmaceutical Sciences

Appendix D

First Reminder Email

November 16, 2017

Dear Participant,

Last month you were emailed asking for your participation to complete an online survey regarding the provision of medication therapy management services. This survey is part of a study entitled, “Factors that Influence the Intent of Pharmacists in the Provision of Medication Therapy Services,” being conducted by researchers at the University of Toledo College of Pharmacy and Pharmaceutical Sciences.

If you would like to participate, please follow the link to complete the survey. I am grateful for your help and want to remind you that participants may enter into a raffle for one of two **\$50 Visa gift cards**.

If you have any questions or comments about this study, please do not hesitate to contact me by email (angela.simon@rockets.utoledo.edu) or contact the principal investigator, Dr. Sharrel Pinto (sharrel.pinto@utoledo.edu).

Sincerely,

Angela M. Simon
PharmD/MS Candidate 2018
Graduate Research Assistant
Pharmaceutical Care and Outcomes Research Laboratory
University of Toledo College of Pharmacy and Pharmaceutical Sciences

Appendix E

Second Reminder Email

November 30, 2017

Dear Participant,

Last month you were emailed asking for your participation to complete an online survey regarding the provision of medication therapy management services. This survey is part of a study entitled, “Factors that Influence the Intent of Pharmacists in the Provision of Medication Therapy Services,” being conducted by researchers at the University of Toledo College of Pharmacy and Pharmaceutical Sciences.

If you would like to participate, please follow the link to complete the survey. I am grateful for your help and want to remind you that participants may enter into a raffle for one of two **\$50 Visa gift cards**.

If you have any questions or comments about this study, please do not hesitate to contact me by email (angela.simon@rockets.utoledo.edu) or contact the principal investigator, Dr. Sharrel Pinto (sharrel.pinto@utoledo.edu).

Sincerely,

A handwritten signature in cursive script that reads "Angela M. Simon".

Angela M. Simon
PharmD/MS Candidate 2018
Graduate Research Assistant
Pharmaceutical Care and Outcomes Research Laboratory
University of Toledo College of Pharmacy and Pharmaceutical Sciences

Appendix F

Third Reminder Email

Dear Participant,

This is the final email reminder for a study entitled, “Factors that Influence the Intent of Pharmacists in the Provision of Medication Therapy Services,” being conducted by researchers at the University of Toledo College of Pharmacy and Pharmaceutical Sciences. Last month you were emailed asking for your participation to complete an online survey regarding the provision of medication therapy management services.

If you would like to participate, please follow the link to complete the survey. I am grateful for your help and want to remind you that participants may enter into a raffle for one of two **\$50 Visa gift cards**.

If you have any questions or comments about this study, please do not hesitate to contact me by email (angela.simon@rockets.utoledo.edu) or contact the principal investigator, Dr. Sharrel Pinto (sharrel.pinto@utoledo.edu).

Sincerely,

Angela M. Simon
PharmD/MS Candidate 2018
Graduate Research Assistant
Pharmaceutical Care and Outcomes Research Laboratory
University of Toledo College of Pharmacy and Pharmaceutical Sciences