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Patients' perceptions of pharmacy services

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A Thesis

Entitled

Patients' Perceptions of Pharmacy Services

by

Alexandra Born

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the

Master of Science Degree in Pharmaceutical Sciences

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An Abstract of

Patients' Perceptions of Pharmacy Services

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Goal: To determine the factors affecting patients' perceived benefits of 1) adherence packaging, 2) medication therapy management (MTM), 3) delivery, 4) automatic refill, and 5) refill synchronization. Additionally, to determine the patients' perceived benefits that predict their interest in participating in a pharmacy service.

Methods: This cross-sectional exploratory study used convenience sampling to survey participants over a seven-week period. Survey questions were designed through elicitation interviews. Validity (factor analysis) and reliability (Cronbach's alpha) were assessed. Linear regression and logistic regression were conducted.

Results: A total of 304 surveys were collected. The majority of the participants were not aware of refill synchronization (68.4%), MTM (58.2%), and adherence packaging (77.3%). Age ($p=0.018$) and the number of medications ($p=0.028$) a participant contributed the most to how patients perceived the benefit of services. Participants who perceived adherence packaging ($\beta=3.098$), MTM ($\beta=2.286$), delivery ($\beta=5.148$), automatic refill ($\beta=12.047$), and refill synch ($\beta=1.598$) will help them feel more in control of taking their medication were more likely to participate in the service.

Conclusion: In an effort to increase patient participation in pharmacy services, pharmacies need to assess patients' perceptions and cater their services to address the patients' beliefs.

I dedicate this thesis to

My parents, Mark and Deborah

My brother, Zach

Brent

My HOSS family

And all others who have helped me step closer to my dream over the past two years

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List of Abbreviations

AACP ..... American Association of Colleges of Pharmacy
ABMS ..... Appointment based medication synchronization
ACA ..... Affordable Care Act
AAMC..... American Association of Medical Colleges
AMA ..... American Medical Association

CMR..... Comprehensive Medication Review
CMS ..... Center for Medicare and Medicaid Services
CPS ..... Cognitive Pharmaceutical Services

HOSS ..... Health Outcomes and Socioeconomic Sciences

IRB..... Institutional Review Board

KMO ..... Kaiser-Meyer-Olkin

OBRA ..... Omnibus Budget Reconciliation Act

PCA..... Principal Component Analysis

TRA..... Theory of Reasoned Action

MAP..... Medication Action Plan
MTM ..... Medication Therapy Management
MTMS..... Medication Therapy Management Services
MTR..... Medication Therapy Review

PMR ..... Personal Medication Record

SPSS..... Statistical Package for Social Sciences

List of Symbols

p..... Statistical Significance

Chapter 1

Introduction

1.1 Background

Traditionally, the main role of the pharmacist has been to prepare and dispense medications, with minimal emphasis on providing patient services.[1] This changed in 1990, when Charles Helper and Linda Strand introduced the concept of pharmaceutical care.[2] Pharmaceutical care is patient-centered and outcomes driven. It requires the pharmacist to work directly with the patient to promote health, prevent disease, and monitor medication use to assure safety and effectiveness. [2] Concurrently, governmental regulations such as The Omnibus Budget Reconciliation ACT (OBRA 90) pushed pharmacy in the direction of greater responsibility, which requires pharmacists to provide counseling to all patients.[3] The Medicare Prescription Drug Improvement and Modernization Act of 2003, requires all prescription drug plan sponsors providing a drug benefit to offer medication reviews and appropriate interventions.[4] In 2006, the MMA went into effect requiring Medicare Part D prescription drug plans to include medication therapy management (MTM) services delivered by a qualified healthcare professional, including pharmacists. Additionally, the American Medical Association (AMA) created CPT codes so healthcare professionals can be reimbursed for providing MTM services to

patients.[5] As a result of these movements, the focus of pharmacy began shifting away from dispensing towards a more patient-centered approach.[6]

Recently, with the passage of the Affordable Care Act (ACA) in 2010, health insurance coverage has expanded to an additional 34 million people in the United States.[7] The Association of American Medical Colleges (AAMC) projected that universal coverage will increase the use of all physicians by 4%, which will create a shortage of physicians.[8] This has given pharmacies the opportunity to implement services to improve patients access to care.[1] Additionally, pharmacists would assist in understanding complex medication regimens,[9] and medication non-adherence.[10] Pharmacists play a key role in providing services to their patients because they are accessible and knowledgeable about medications. A variety of pharmacy services have been implemented to assist in overcoming barriers so patients can receive optimal care.

A pharmacy service is defined as, an action organized by a pharmacy, delivered by a pharmacist or other health professional, who assists a patient to optimize the process of care, with the aim to improve health outcomes.[11] There are a wide variety of pharmacy services including reminder systems, minute clinics, compounding, screenings, anticoagulation management, and pharmacogenomics. However, these services have shown evidence in improving health for patients'; Medication Therapy Management services, [12] adherence packaging, [13] delivery, [14] refill synchronization, [15] and automatic refill. [14] [15] Pharmacists provide MTM services to help patients benefit from their medications by actively managing drug therapy and by identifying, preventing, and resolving medication-related problems.[5] Adherence packaging is a card with labeled blisters, which eliminates the need for the patient to take multiple pills from different

bottles or transfer pills from bottles to over the counter pill organizers.[16, 17] Adherence packs adopt a process known as refill synchronization, which can also be done with pill bottles. Refill synchronization will sync a patients' medications to be filled at one time, minimizing multiple trips to the pharmacy for the patient.[18] Delivery and automatic refill are more common services seen in pharmacies. Delivering medications will assist patients who do not have transportation to the pharmacy or are consistently forgetting to pick up their medications.[19] Automatic refill is a program in which the pharmacy refills the prescription for the patient, so the patient does not have to remember every month to contact the pharmacy.[20] These services are gradually being implemented into pharmacies and have shown to have an impact on patients' outcomes.[21, 22] However, patients are either unaware of the existence of these services,[23] don't see them as being valuable,[24] or are unaware of how to utilize them.[25] Patients beliefs and perceptions play a crucial role in predicting their utilization of these services.

Irwin M. Rosenstock and Godfrey M. Hochbaum created The Health Belief Model (HBM) to help explain and predict how these beliefs and perceptions contribute to a patients likelihood of taking a preventative action (figure 1-1).[26] This model has been used in multiple studies to predict a patients' likelihood to take action in screenings for breast cancer,[27] high blood pressure,[28] smoking cessation programs,[29] diabetes management,[30] etc.

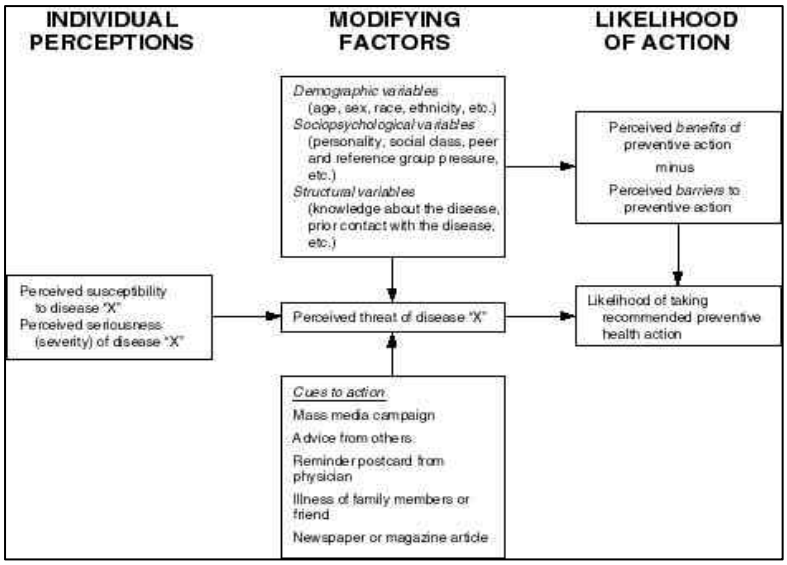

Figure 1-1 Health Belief Model by Irwin M. Rosenstock and Godfrey M. Hochbaum[31]

A patient is likely to take the recommended action if the patient perceives benefits in the action and perceives this action to lower the perceived threat of their disease. However, there are multiple factors that affect patients' perceived benefit and perceived threat of a disease. Demographic variables, sociopsychological variables, and structural variables contribute to both the perceived threat and benefits. Additionally, perceived susceptibility and cues to action affect how a person perceives the threat of their disease. These constructs determine the likelihood of a patient to take action in a service. The HBM can assist in predicting a patients' intent to participate in a pharmacy services. Assessing patients' benefits of the service and the factors that affect these benefits is critical in a pharmacy.

1.2 Rationale

The role of the pharmacist is changing, with new opportunities to provide patient centered services in pharmacies. Pharmacies have made significant progress in implementing services to improve patients' health and in alleviating barriers. In order to assess a patients' intent to participate in a service, patients' perceptions of the benefits of these services need to be identified. Many benefits have already been identified in the literature, however there is a need to assess the factors that contribute to how patients perceive these benefits. Additionally, to determine which benefits patients perceive as predictors to participating in the service.

1.3 Goal

To examine patients intent to participate in pharmacy services

1.4 Objectives

1. To determine the factors affecting patients' perceived benefits of various pharmacy services
2. To determine the patients perceived benefits that predict their interest in participating in a pharmacy service

Chapter 2

Literature Review

2.1 The Transformation of Pharmaceutical Care

1990-2000

Traditionally, the main role of the pharmacist has been to prepare and dispense medications, with minimal emphasis on providing patient services. In the 1980s Hepler and Strand introduced pharmaceutical care. Pharmaceutical care is a patient-centered, outcomes oriented pharmacy practice that requires the pharmacist to work directly with the patient to promote health, prevent disease, and to monitor medication use to assure safety and effectiveness.[2] This concept allowed pharmacists to shy away from their traditional roles of filling prescriptions, and moving toward accepting full responsibility for drug therapy outcomes. Pharmacists are becoming recognized as gatekeepers who assure the appropriateness of medications prescribed for patients, and consult with prescribing physicians to request clarification when there is a potential problem. Pharmacists also are gaining recognition as patient educators who discuss drug therapy

with patients and empower patients to accept responsibility for their own therapeutic outcomes.

The 1990's, is known as the "pharmaceutical care era", which witnessed many chances to pharmacy and health care. In 1990, the Omnibus Budget Reconciliation Act (OBRA 90) was developed. OBRA 90 required that pharmacists participate in a screen of prescriptions, offer to discuss medications, and maintain extensive records about Medicare and Medicaid patients.[34] Additionally, In 1995, a special American Association of Colleges of Pharmacy (AACP) committee analyzed pharmaceutical care and changed the structure of pharmacy students' professionalism and professionalization.[35] Over the course of more than a decade, pharmacists have worked towards improving this concept of pharmaceutical care, this continued throughout the millennial decade as well.

2000-2010

The term pharmaceutical care and medication therapy management has been used interchangeably in the past. In 2004 eleven national pharmacy organizations adopted the term medication therapy management (MTM). The Medicare Modernization Act of 2003, requires Medicare Part D prescription drug plans to include medication therapy management services delivered by a qualified healthcare professional, including pharmacists, beginning in 2006. MTM services target beneficiaries who have multiple chronic conditions (such as diabetes, asthma, hypertension, hyperlipidemia, and congestive heart failure), take multiple medications, or are likely to incur annual costs above a predetermined level.[36] Medication therapy management is a unique niche for the

pharmacy profession, allowing pharmacists to apply their extensive medication knowledge as medication experts with the intent of improving patient outcomes. Shortly following in 2007, the pharmacy profession reached an important milestone by obtaining Category I status for MTMS CPT codes. This was a major step forward which expanded pharmacists' ability to provide valuable professional services for their patients and receive reimbursement.

2010-Present

In March 2010, president Obama sign into law the Affordable Care Act (ACA), also referred to as health care reform. The goal is to give more Americans access to affordable, quality health insurance and to reduce the growth in U.S. health care spending. If people can afford healthcare, but choose not to buy it a fee must be paid called the individual shared responsibility payment. As a result of the Affordable Care Act, health insurance coverage will expand to an additional 34 million people in the United States.[7] The Association of American Medical Colleges (AAMC) projected that universal coverage will increase use of all physicians by 4%, which will cause a shortage of physicians. This has given pharmacies the opportunity to step up and provide services to their patients to improve their patients' health outcomes.

2.2 Perceptions

Starting in the late 1980s, researchers worked to identify core components of patient-centered care.[37] In 1993 the Picker Institute identified eight domains: respect for patient preferences and values; emotional support; physical comfort; information,

communication and education; continuity and transition; co-ordination of care; involvement of the family and friends and access to care.[38] Further research has yielded similar core concepts and the International Association of Patient Organizations identifies respect for patient needs and preferences as the most consistent element of definitions of patient-centered care.[38] Healthcare organizations increasingly seek to improve quality by focusing care on patient needs and preferences, with patient-centeredness recognized as a domain of quality in its own right.[39]

As calls are made for a more patient-centered health care system, it becomes critical to define and measure patient perceptions of health care quality and to understand more fully what drives those perceptions.[40] The perception of a service is one of the most important drivers of customer satisfaction.[40] Determining consumer perception of patient-centered services provides a perspective through which standards of care can be identified, enabling for overall quality and satisfaction for improvements to be made accordingly.[40] Bridging the gap between the state of the current health care system and the system that patients expect and need is an over- whelming task for all health care disciplines.[41] Consideration of patients' perspectives of the influence of health care services on the needs and expectations can improve health care systems in various ways.[41]

2.3 Factors affecting patient awareness

Pharmacists are one of the most accessible health care providers, however many people are unaware of the services they offer or do not see the value in these services. Patients are not aware of the full scope of clinical services that pharmacists can

provide.[23] There are many reasons why patients may not be aware of the services that are offered at pharmacies. A major factor contributing to a lack of patient awareness about services is that pharmacists have given inadequate attention to public relations and marketing of these services.[42] Another factor contributing to the public's low awareness is that some pharmacies discourage communications with patients, by having the patient sign a counseling waiver.[42] The inconvenience of waiting for a prescription to be filled makes patients feel hurried and they often do not realize that they are signing away their rights for counseling. A third factor that has compromised public awareness about the patient care a pharmacy can offer is the scarcity of "stories" that convey how a patient's health and/or quality of life was improved by pharmacists care.[42] Most patients will agree that stories are more powerful than data in helping them understand the value of care. The 2010-2011 Argus Commission was charged to examine how AACP and its members can engage with appropriate consumer and payer groups to increase awareness of "the new American pharmacist" and the pharmacists' role in patient centered care. This resulted in the 2015 Vision Statement, which characterizes the roles and responsibilities of "the new American pharmacist". There is low public awareness about not only these roles and responsibilities but also the value of the pharmacist in ensuring optimal therapy outcomes. AACP can help increase the awareness of the public by 1) partnering with other professional organizations to increase consumer awareness, 2) enhancing curricular content, 3) developing and evaluating innovative technologies that promote patient-pharmacist communication, 4) collaborating in public relations efforts by the profession, and 5) collaborating in legislative advocacy.[42]

2.4 Pharmacy Services

The pharmaceutical care philosophy was transformed into a service-based definition, where drug-related services were provided by pharmacists. The term cognitive pharmaceutical services (CPS) was further adapted to incorporate aspects lacking in previous definitions such as, health services at a local community or population level and acknowledging the role of other pharmacy staff.[11] Although pharmaceutical care may remain the primary focus for pharmacist driven services, a broader definition is needed to acknowledge the wider role that the community network and community pharmacies individually play in health care. In order to gain an understanding of the full suite of professional pharmacy services that may be offered the following the term professional pharmacy service was adapted. A professional pharmacy serve is an action or set of actions undertaken in or organized by a pharmacy, delivered by a pharmacist or other health care practitioner, who applies their specialized health knowledge personally or via an intermediary, with a patient/client, population or health professional, to optimize the process of care, with the aim to improve health outcomes and the value of healthcare.[11] The professional pharmacy service definition is constructed conceptually around Donebedians's framework for evaluating the quality of medical care.

Pharmacists work in a wide range of settings, the majority of which provide services directly to patients. They possess substantial education, knowledge, and skills in the clinical application of medications in the care of patients, and are among the most readily accessible of health care professionals.[43] There are many services that can be offered at a pharmacy such as medication therapy management services, different

packaging services, automatic refill, refill synchronization and delivery of medications. By providing patients with these services pharmacy is moving toward a more patient-centered approach.

This positions pharmacists to serve patients and their other health care providers in optimizing medication use, reducing/preventing medication-related problems, and improving health outcomes by providing medication therapy management and other pharmaceutical care services, as well as certain health promotion, wellness education, and disease prevention.[43]

2.4.1 Medication Therapy Management (MTM)

Medication Therapy Management is a strategy for delivering a variety of non-dispensing clinical pharmacy services to patients and their clinicians; it is a structure for providing what pharmacists referred to in the early 1990s as pharmaceutical care.[44] In 2003, the Medicare Modernization Act required that Medicare part D insurers provide medication therapy management (MTM) services (MTMS) to selected beneficiaries, with goal of providing education, improving adherence, or detecting adverse drug events and medication misuse.[5] Oversight of these programs were entrusted to the Centers for Medicare and Medicaid Services (CMS), with each MTMS requiring approval prior to implementation.[5] In October 2007, PSTAC received approval from the AMA to reclassify pharmacist MTM service codes from Category III to Category I. This changed the status of the pharmacist MTM codes from "emerging technology" to recognized standard of care and improved recognition by acceptability to payers. This allowed pharmacists to get paid for providing these services to patients. Medication therapy

management services include medication therapy reviews, pharmacotherapy consults, anticoagulation management, immunizations, health and wellness programs and many other clinical services.[45] It has been demonstrated that Medication Therapy management Services (MTMS) are currently being delivered at both local and regional levels can lead to a reduction in overall health care expenditures by optimizing therapeutic outcomes.

Medication Therapy management in Pharmacy practice: Core Elements of an MTM Service Model is an evolutionary document that focuses on the provision of MTM services in settings where patients or their caregivers can be actively involved in managing their patients' medications. Adoption of this model is voluntary, however it this model has been crafted to maximize both effectiveness and efficiency of MTM service delivery across pharmacy practice setting to improve outcomes, so it is highly recommended. It consists of 5 core elements; a comprehensive medication review (CMR) to identify drug-related problems, a personal medication record (PMR) which lists information regarding a patient and all medications they are taking, a medication action plan (MAP) which provides expectations of duties and outcomes of the patient and healthcare provider, performance of interventions or referral to correct drug-related b problems, which may require coordination with other healthcare professionals; and documentation and follow-up with the patient and other healthcare providers.[46] MTM programs are demonstrating positive clinical, economic, and humanistic outcomes across diverse patient populations in various patient care settings. An important component of MTM's ultimate success is the patients' satisfaction with the services provide.[47] A dissatisfied patient may have little motivation to continue to participate in MTM services, undermining the efforts of even the most sophisticated MTM programs.[47] Motivated and

active participation in MTM may more easily allow for the establishment of a link between specific MTM services and improved health outcomes.[47]

Satisfaction with Medication Therapy Management Services at a University Ambulatory care clinic found that patients expressed high overall levels of satisfaction with the program, pharmacists, and the services they received.[47] Patients were more satisfied with the services they received if they were taking more than 10 medications, illustrating the potential value of MTM services in populations with a high degree of polypharmacy.[47] Patient satisfaction with a pharmacist-provided telephone MTM program also showed high satisfaction levels.[13, 48] This is important because Part D plans are using the telephone as a method of MTM delivery. These results suggest that for some patients MTM can be delivered via the telephone without compromising patient satisfaction.[48] Most patients appreciate this type of counseling and it seems feasible to implement this intervention in daily clinical practice.[13] Patients who received counseling were more satisfied with some information, had less concerns about medication and less frequently had a 'skeptical' attitude.[13]

The Asheville Project began in 1996 as an effort by the City of Asheville, North Carolina and a self-insured employer, to provide education and personal oversight for employees with chronic health problems such as diabetes, asthma, hypertension, and high cholesterol.[22, 49-51] The Asheville Project has inspired a new health care model for individuals, it is payer driven and patient-centered. Patients with diabetes in community pharmacies in this study maintained clinically meaningful improvements in their A1C concentrations over time, improved patient satisfaction with pharmacy services, and third party payers experienced an overall decline in mean total direct medical costs.[51]

Medication therapy management is already in widespread practice, which present both challenges and opportunities for researchers and policy makers.[44] The MTM programs of the future may contribute to coordinated and improved care through delivery within Accountable care organizations or patient-centered medical homes.[44]

2.4.2 Adherence Packaging

Packaging aids have been in use for many years, and are widely employed for patients perceived as having problems with medicine-taking at home. Adherence packaging refers to any assembly of medications, such as pill box, blister pack, bottle, or single use container that physically incorporates a system for the day and/or time when the medications are to be taken.[52] Adherence packaging is defined by the adherence attributes that can be included in the design-most notable a dosing calendar feature, detailed dosing instructions, and/or patient information.[53] Adherence packaging has been associated with increase refill adherence and a decrease in the likelihood of medication discontinuation.[54]

Pill organizers and unit dose blister packs are two systems that have been commonly used in clinical trials.[16] One type of pill organizer is a container with seven compartments, one for each day of the week. Pill organizers may improve adherence by displaying pills to be taken on a daily basis and identifying missed pills. The use of pill organizers requires the active involvement of participants, who must place pills from bottles to the individual compartments. A unit-dose blister pack is a card with labeled blisters, each of which contains pills to be ingested at one time.[16] Blister packs are a

ready-to-use package, which eliminates the need for patients to transfer the pills themselves from the bottles to the organizers.

Two trials have shown a benefit of blister packs on adherence by pill counts, I comparison with pill bottles without an organizer in elderly patients.[16] Another trial performed with 180 hypertension patients also shower higher adherence in the groups with the blister packs compared to the pill bottle group.[54] A study known as TRACE found the percentile for 80 percent adherence in the pill-organizer group was greater than that in the blister-pack group, indicating that a larger portion of participants in the pill organizer group than in the blister-pack group had an adherence of less than 80 percent.[16]

A prospective study and survey assessed patient perceptions of blister packs. Out of the patients surveyed, 79% found the packaging easy to use, 46% felt that it made it easier to remember to take medication, and 61% signified that they would continue the packaging.[55] In addition to perceptions, patients had a higher knowledge of the correct medication instructions assessed by a series of medication related questions.[55]

Scientific data shows that blister packs can increase patient outcomes, specifically satisfaction.[53, 56] The trend of leveraging the unique characteristics of packaging to help patients understand how and why to take their medicines is growing. Scientific data shows that blister packs can increase patient outcomes.

2.4.3 Refill Synchronization

A California pharmacist, John Syroka, implemented appointment-based medication synchronization in 1995. Appointment based synchronization standardizes

medication dispensing schedules to improve medication management and adherence.[15] The complexity of a patient's therapy influences medication adherence, and it has been suggested that standardizing medication schedules can improve medication adherence and health outcomes.[15, 18, 21, 57] Several programs that simplify patient medication regimens currently are being offered in community pharmacies. Known by carious names such as, patient centric model, med sync, sync your meds.[18] Medication synchronization programs coordinate refills, decrease regimen complexity, boost adherence, and provide an opportunity for continual interaction between pharmacists and patients to review all of these patients' medications on a monthly basis to ensure safe an appropriate use. Evidence also indicates that medication adherence can improve if patients consolidate the number of visits to the pharmacy for medication refills and they visit fewer pharmacies for their medication-related needs.

A study conducted by Choudry et al found that patients taking lipid lowering statins or antihypertensive angiotensin medications made an average of 5 visits to a pharmacy over a three-month period. In addition, 10% visited a pharmacy more than 11 times in the same period. Patients making more trips to the pharmacy had adherence levels that were 8.4% lower than those who had refill synchronization.[57]

A study of an appointment-based medication synchronization program in rural pharmacies in the Midwestern United States indicated that the program was associated with greater patient adherence and persistence when patients first start their chronic medications. Patients who enrolled in this ABMS who received medication in 6 different chronic disease categories had 3.4 to 6.1 times greater odds of adherence over a 1 year

period.[15] Individuals who were not enrolled were at least 50% more likely to stop taking their chronic medications over 1 year.[15]

The centralized reminder and refill process can address the problems of simple forgetfulness, poor continuity of care, poor provider-patient communications, and insurance, thereby allowing these and other issues to be resolved before patients arrive at the pharmacy. On the revenue side, ABMS can reduce lost sales due to non-adherence and help pharmacies make a strong case for having access to patients in preferred pharmacy networks.[15] Pharmacies that show the ability to drive patient medication adherence and persistence will be able to demonstrate their value to health plan administrators. On the cost side, ABMS can help pharmacists manage inventory, improve workflow, and manage personnel costs better. Synchronization can also free pharmacist time to provide medication therapy management.[18]

2.4.4 Delivery of Medications

The rise in the percentage of the nation's elderly citizens, combined with the fact that the elderly account for the majority of home health care patients, has increased the need for efficient and effective services in the delivery of home health care.

There are many services that are being implemented into pharmacies to free up time of the pharmacist. One of these services is home delivery of medications. Home delivery of medicines to customers allows pharmacies to plan their workload, as opposed to having to respond immediately to prescriptions presented in person at the counter. There have been different views on home delivery of medications. There were many reservations expressed about delivery, this was usually due to the added cost of the

service. Also, since the delivery of medicines to patient homes reduced the contact between patients and the pharmacist, this may have implications for the pharmacist's role in transforming drugs into social objects and raising the status of the pharmacy. Those that make the switch to home delivery gain cost-saving, safety, and convenience benefits. All of these benefits allow the patient to give minimal effort to pick up a medication from a pharmacy.[19] Also, taking advantage of home delivery does not only help the patient, pharmacy-related waste is a significant problem in healthcare.

2.4.5 Automatic Refill

Automatic refill is a technology that tells the pharmacy to fill your prescription when it is due to be filled, without the need for the patient to call in advance and request it. Most of the big chain pharmacies and independent pharmacies offer this service to some degree. It will also send a reminder text, call or email when the prescription is ready to be picked up. Automated refills discover when the patient is out of refills automatically, and notifies the physician. By reminding the patient that the prescription is ready the likelihood of them picking up that prescription increases. This system is also very profitable to the pharmacy. The more prescriptions the pharmacy refills the more profitable they are.

Steienr and Prochazka identified 41 studies between 1969 and 1994 that have used manual or computerized pharmacy refill data to measure compliance. Two of the studies reported that reminders issued to non-adherent patients, as defined by prescription refill data, improved medication compliance rates. They concluded that automated

pharmacy data is sufficiently consistent to serve as a source of feedback to providers about adherence and quality of care, especially in the continuation phase of treatment.

Automatic prescription refill programs are known to support patient adherence to medications. Promoting a refill program as a timely and convenient means of safeguarding against running out of medications or medication refills may increase program enrollment and medication adherence.[20]

2.5 The Health Belief Model

The Health Belief Model (HBM) is by far the most commonly used theory in health education and health promotion. It was developed in the 1950s as a way to explain why medical screening programs offered by the U.S. Public Health Service, particularly for tuberculosis.[58] The underlying concept of the HBM is that health behavior is determined by personal beliefs or perceptions about a disease and the strategies available to decrease its occurrence. The following four perceptions serve as the main constructs of the model; perceived severity, perceived susceptibility, perceived benefits, and perceived barriers. Each of these perceptions, individually or in combination, can be used to explain health behavior. More recently, other constructs have been added to the HBM, expanding to include cues to action, motivating factors, and self-efficacy.

The construct of perceived severity speaks to an individual's belief about the seriousness or severity of a disease. It is based on the beliefs a person has about the difficulties a disease would create or the effects it would have on the persons' life.[26] Perceived susceptibility is one of the more powerful perceptions in prompting people to adopt healthier behaviors. The greater the perceived risk, the greater the likelihood of

engaging in behaviors to decrease risk. The construct of perceived benefits is a person's opinion of the value or usefulness of a new behavior in decreasing the risk of developing a disease.[26] People tend to adopt healthier behaviors when they believe the new behavior will decrease their chances of developing a disease. Perceived barriers is an individual's own evaluation of the obstacles in the way of adopting a new behavior. This construct is considered the most significant in determining behavior change. The four major constructs of perception are modified by other variables, such as culture, education level, past experiences, skill, and motivation. These are individual characteristics that influence personal perceptions. In addition to the four beliefs or perceptions and modifying variables, the HBM suggests that behavior is also influenced by cues to action. Cues to action are events, people, or things that move people to change their behavior. In 1998, self-efficacy was added, which is the belief in one's own ability to do something. The contribution of these constructs assist in determining the likelihood of a person to take a preventative health action (figure 1-1).

Chapter 3

Methodology

This chapter describes the methodology used for this study. It is discussed under the following sections.

3.1 Study design

3.1.1 Study population

3.2 Survey creation

3.3 Survey validity and reliability

3.4 Data collection

3.5 Data entry

3.6 Data analysis

3.1 Study Design

This is a survey based cross-sectional exploratory study. A survey was used to assess patients' perceptions of various pharmacy services. The pharmacy services include 1) Medication Therapy Management, 2) blister packaging, 3) refill synchronization, 4) automatic refill, and 5) delivery. These surveys were passed out February-March. Since this study involves confidential data, approval was obtained from the University of

Toledo Social, behavioral, and education IRB. The IRB protocol number is 201113 and the approval date was January 15th, 2016.

3.1.1 Population

Inclusion Criteria

1. Adults who were at least 18 years of age or older
2. Willing to provide answers to survey questions
3. Filled a prescription less than 6 months ago

Exclusion Criteria

1. Adults who cannot speak or understand English
2. Filled a prescription more than 6 months ago

3.2 Survey Creation

A review of the literature indicated that no existing instrument measured the specific objectives of this study. Therefore, a new survey was created. Elicitation interviews were conducted with 48 people. Since a convenient sample is being used people were approached at a fundraiser that consisted of a large demographic of people. During the interviews people were asked about the five services mentioned above. First, they were asked if they were aware of the services. If they were not aware of the service I provided them with a brief description and asked what benefit they perceived. Next, I asked them if they would be interested in participating in the service. The interviews lasted approximately five minutes per person. The interviews revealed that most patients were unaware of the existence of such services and were not aware of how to utilize

them. The elicitation interviews did not revel any additional benefits that were not already identified in the literature. Notes were taken based off of the responses from the elicitation interviews and the main themes were used to create the questions in the survey.

Based on the elicitation interviews and committee member's input, a self-administered questionnaire was constructed. There were five sections in the survey with both close and open-ended questions. The five sections were separated into; 1) benefits on adherence packaging, 2) benefits of MTM, 3) benefits of delivery, 4) benefits of automatic refill, and 5) benefits of refill synchronization. There was also an about me section to collect demographic data. For all of the close-ended questions in the survey, a 5 point Likert scale was used to measure responses (1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree).

Participants were first asked if they were aware of the pharmacy services. This was used as a variable to assess if awareness has an impact on how patients perceive the benefits of a service. This was measured using a dichotomous scale (0=no 1=yes). Following, the following sections that were mentioned above were assessed.

The benefits for each service were identified in the literature. Some benefits were the same for services, however there were some benefits that differed. There were 25 total questions in the survey including the demographic questions. If participants were already participating in the service then they were asked to skip that section. This was because the survey assessed patients' intent to participate.

Participants' intent to participate in a service was measured on a dichotomous scale (1=yes and 0=no). If patients were not interested in participating they were

provided with multiple reasons as to why they may not want to participate. These reason were identified in the literature as barriers to not wanting to participate in the service. They had the option to choose one of these reasons or write in their own reasons.

A laminated sheet with information regarding the services was given to the participant for their reference. This assisted the participant in making a perception regarding the benefits of each service. A picture of an adherence pack was on the back to aid as a visual to the participant.

3.3 Survey Validity and Reliability

The survey was tested for face validity and construct validity. First, two-pharmacy practice faculty members and 9 pharmacy graduate students reviewed the instrument. Based on their comments and suggestions the required changes were made to the survey. The survey was then tested for construct validity by conducting an exploratory factor analysis using principal component analysis with a varimax rotation. Twenty-six items from the survey were used to conduct a forced extraction. Any item with a loading below 0.40 was considered to be weak and was removed from the subsequent analysis. After modifications were made in the survey based on the factor analysis results, the reliability of the questionnaire was determined using Cronbach's coefficient alpha. The questionnaire had six sections; however the demographics section was excluded from the test for reliability. A Cronbach's alpha score of 0.7 is generally considered an acceptable cutoff for a reliable questionnaire [59]. The reliability of the five other domains was analyzed.

3.4 Data Collection

The research instrument used for this study was a structured questionnaire created by the researcher (Appendix A). This survey was given to a convenient sample with the study location being at the food court in The Westfield Franklin Park Mall, the baggage claim at The Detroit Metropolitan Wayne County Airport, and main campus/health science campus at The University of Toledo. These locations were decided by the researcher, because of the large demographic and the easy access to participants, which will improve generalizability. The study was carried out over a seven-week period, beginning January 26th, 2016-March 28th, 2016.

Nine graduate research assistants and 6 University of Toledo students assisted in passing out the surveys. A script was give to ensure consistency among researchers. The surveys were given face-to-face, which was decided considering a convenient sample was used and face-to-face surveys typically have a high response rate. Approximately 336 participants were approached and 304 surveys were successfully completed. The non-response rate was 90.4%. According to the research assistants the most common reason participants did not want to fill out the survey is because they were busy.

Out of the 304 surveys, 28 surveys had only the demographics section filled out and were considered as an unusable survey for statistical analysis. This was because these 28 participants did not fill a prescription at a pharmacy in the last 6 months. The time frame six months was chosen because this was considered enough time for the participant to be familiar with the services that are offered at their pharmacy.

3.5 Data Entry

After the survey collection was completed, the data was entered using Statistical Package for the Social Sciences (SPSS) version. The researcher entered the data at the end of each week. Approximately 40 surveys were entered at the end of each week, which took about an hour and a half. There were not any audits performed on the data.

3.6 Data Analysis

The data collected was entered using SPSS and was analyzed using appropriate statistical methods. The construct validity of the survey was established using factor analysis and the survey was modified based on the results obtained. The internal reliability of the survey was assessed using Cronbach's alpha. The survey was considered incomplete if any close-ended questions were left unanswered. There were not any incomplete surveys. A linear regression was conducted to test to assess the association of factors such as, demographics, socioeconomic status, awareness of pharmacy service, number of medications, etc. on the perceived benefits of the pharmacy service. The independent variables were separated into two categories (0=female 1=male, 0= less than a bachelors 1= more than a bachelors, 0= less than middle aged 1= more than middle aged, 0=non-white 1= white, 0= not from Ohio 1= from Ohio). The dependent variable was continuous and all assumptions were met, which is why linear regression is the appropriate statistical test. Next, a binary logistic regression analysis was used to test which benefits participants thought were the most important to actually lead them to participate in the service. The dependent variable was intent to participate, which was

dichotomous (0=no 1=yes) and all assumptions were met, making this an appropriate statistical test.

Chapter 4

Data Analysis and Results

This chapter describes the analyses performed on the data that was collected and presents the results of the study. The chapter is divided into six parts:

4.1 Validity

4.2 Reliability

4.3 The demographic characteristics of survey respondents

4.4 Frequency distribution

4.5 The results obtained from the statistics to answer Objective 1

4.6 The results obtained from the statistics to answer Objective 2

4.1 Validity

Table 4.1.1 KMO and Barlett's Test

KMO and Barlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.654
Barlett's Test of Sphericity	Approx. Chi-Square Df Sig.	2101.513 325 .000

The KMO and Barlett's Test show that there are linear relationships between the variables and it is appropriate to run principal components analysis on the current data

set. The value of Kaiser-Meyer-Olkin (KMO), the measure of sampling adequacy is .654. This suggests that the degree of common variance is good; or "mediocre" on Kaiser's (1974) classification of measure values. This indicated that the sample size was adequate for the analysis. Bartlett's test of sphericity was significant for the sample ($p < 0.000$), which indicated that the set of correlations in the correlation matrix was significantly different from zero and suitable for factor analysis.

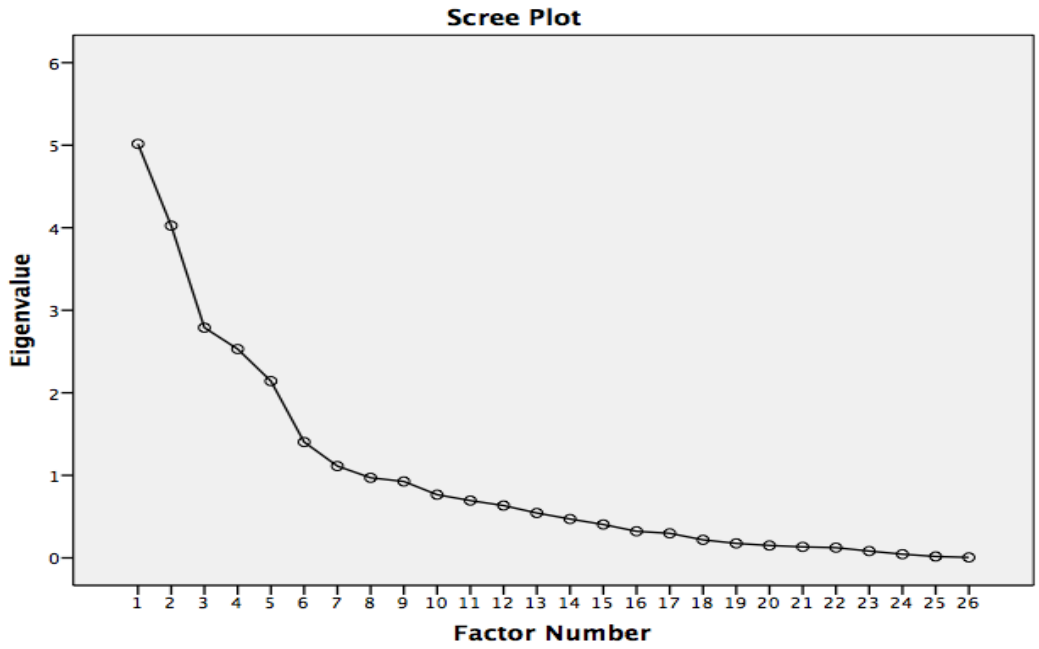

Figure 4.1.1 Scree Plot

Based on the evaluation of the scree plot, a decision was made to retain all eigenvalues before the sixth eigenvalue. A forced extraction was carried out for all 5 factors. Together, these 5 factors accounted for 65.4% of the total variance.

Table 4.1.2 Principal Components Analysis with corresponding factor loadings

Item	Question	Factor				
		Benefit of MTM	**Benefit of Adherence Packaging**	**Benefit of Automatic refill**	**Benefit of Delivery**	**Benefit of Refill Synch**
AP_a	Help take meds on time		.811			
AP_b	Help reassure me that I am taking correct meds		.786			
AP_c	Help me feel more in control of taking my meds		.741			
AP_d	Improve satisfaction of the pharmacy		.842			
AP_e	Reduce human error		.531			
MTM_a	Help take meds on time	.910				
MTM_b	Help reassure me that I am taking correct meds	.422				
MTM_c	Help me understand why I am taking my meds	.914				
MTM_d	Help me feel more in control of taking my meds	.626				
MTM_e	Build my relationship with my pharmacist	.791				
MTM_f	Will improve my health					
MTM_g	Improve satisfaction of the pharmacy					
Del_a	Help take meds on time				.643	
Del_b	Help me feel more in control of taking my meds				.868	
Del_c	Allow me more time				.422	

Del_d	Improve satisfaction of the pharmacy			.610	
Auto_a	Help take meds on time		.737		
Auto_b	Help me feel more in control of taking my meds		.616		
Auto_c	Help remind me to pick up my meds		.943		
Auto_d	Improve satisfaction of the pharmacy		.927		
RF_a	Help take meds on time				.652
RF_b	Help me feel more in control of taking my meds				.782
RF_c	Build my relationship with my pharmacist				.410
RF_d	Allow me more time	.402			.520
RF_e	Improve satisfaction of the pharmacy				.610
RF_f	Decrease multiple trips to pharmacy				.474

Table 4.1.2 on principal component analysis shows the factor loadings for the specific items. Item number MTM_f and MTM_ g were removed from the analysis due to low factor loadings. The questions that were eliminated were “MTM will improve my health” and “MTM will improve my satisfaction of the pharmacy.” This could be explained because the first question stating “MTM will improve my health” is very broad considering it is not focusing on one area of health, such as adherence to medications. The second question stating, “MTM will improve the satisfaction of the pharmacy” could be explained because this is not directly related to the benefits of MTM. There is not a correlation presenting that MTM improves the satisfaction of the pharmacy in general. It

is possible that MTM may improve the satisfaction of the "pharmacist" but not of the pharmacy as a whole. Both these question could have been rephrased to better assess the construct.

4.2 Reliability

Table 4.2.1 Internal Consistency reliability

Section	Cronbach's Alpha	N of Items
Adherence Packaging	.857	5
Medication Therapy Management	.772	5
Delivery	.799	4
Automatic refill	.866	4
Refill Synchronization	.769	6

The overall results of the reliability test reveals that the survey was a strong and consistent survey, which can be used in future studies on a larger population with few modifications. The reliability scores for each section are shown in table 4.2.1.

4.3 Demographic Characteristics

Table 4.3.1 Demographic characteristics of the study population

Characteristic	n (%)
Age	
18-24	82 (27)
25-34	68 (22.4)
35-44	33 (10.9)
45-54	47 (15.5)
55-64	40 (13.2)
65-74	19 (6.3)
75+	15 (4.9)
Sex	
Female	143 (47)
Male	161 (53)
Number of medications	
0	10 (3)

1-3	112 (36.8)
4-6	73 (24)
7-9	23 (7.6)
10-12	27 (8.9)
<13	31 (10.2)
Race	
White	239 (78.6)
Hispanic or Latino	7 (2.3)
African American	46 (15.1)
Native American or American Indian	3 (1)
Asian/Pacific Islander	9 (3)
Income	
<$30,000	148 (48.7)
$30,000-$50,000	55 (18.1)
$50,000-$75,000	43 (14.1)
$75,000-$100,000	33 (10.9)
+$100,000	25 (8.2)
Education	
Some high school	1 (.3)
High school diploma/GED	15 (4.9)
Some college	68 (22.4)
Associate degree	37 (12.2)
Bachelor's degree	148 (48.7)
Master's degree	28 (9.2)
Doctorate degree	7 (2.3)
State	
Ohio	221 (72.7)
Michigan	51 (16.8)
Indiana	18 (5.9)
Other	14 (4.6)
Pharmacy Location	
Independent	40 (13.2)
Grocery Store Chain	99 (32.6)
Retail Chain	165 (54.3)

Table 4.3.1 represents the demographics of the study population. Descriptive statistics performed on the data revealed that the population was 53% male (n=161) and 47% (n=143) female respondents, which is nearly equal. Most respondents were between the ages of 18-24 (27%) and between the ages of 25-34 (22.4%). Most of participants were prescribed between 1-3 (40.1%) and 4-6 (24%) medications. Majority of

participants were white (78.6%) and 15.1% were black. Almost half (48.7%) annual income was less than $30,000. A little less than half of the participants have a bachelor's degree (48.7%) with 22.4% finishing some college. 2.3% have a doctorate degree while only 0.3% only finished some high school.

4.4 Frequency distributions

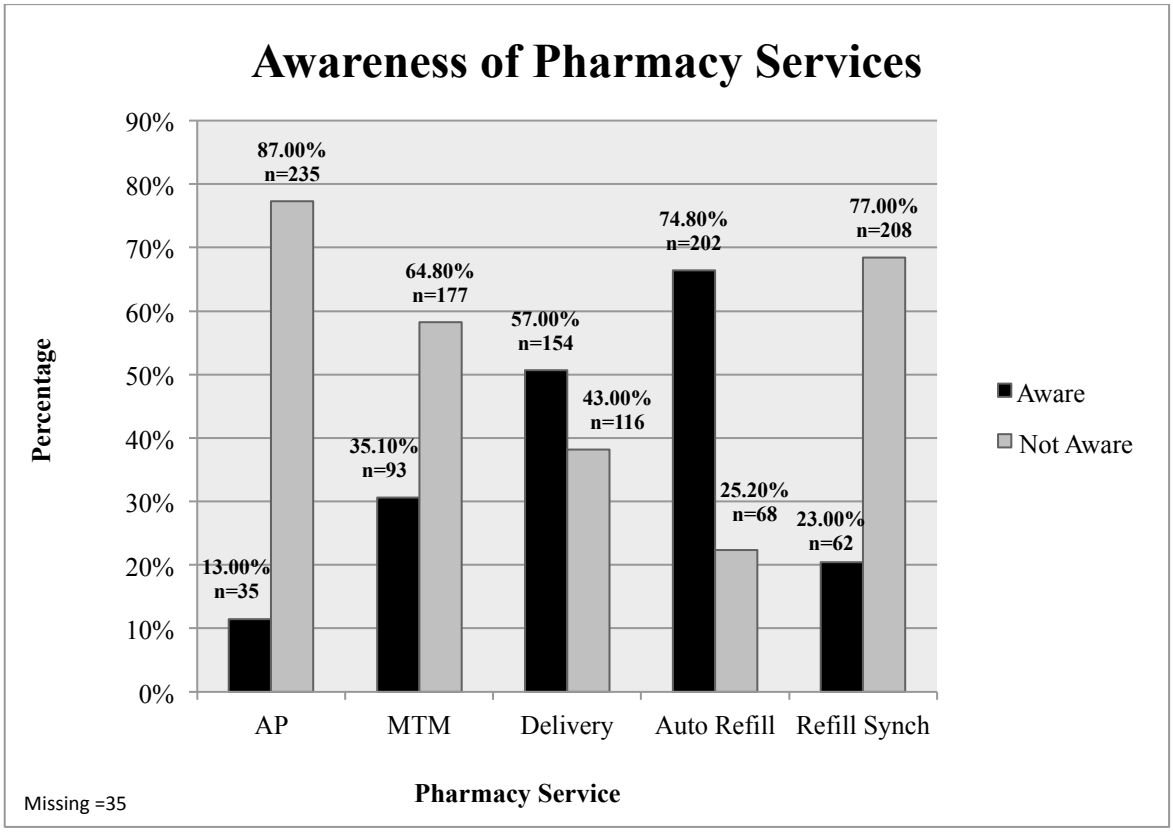

Figure 4.4.1 Frequency Distribution of Awareness of Pharmacy Services

More than three-fourths of the participants that were surveyed were not aware of adherence packaging (77.3%), MTM (58.2%), and refill synchronization (68.4%). About half of the people that were surveyed were aware of delivery services in a pharmacy and 66.4% of participants were aware of automatic refill, making it the service that people were the most aware of.

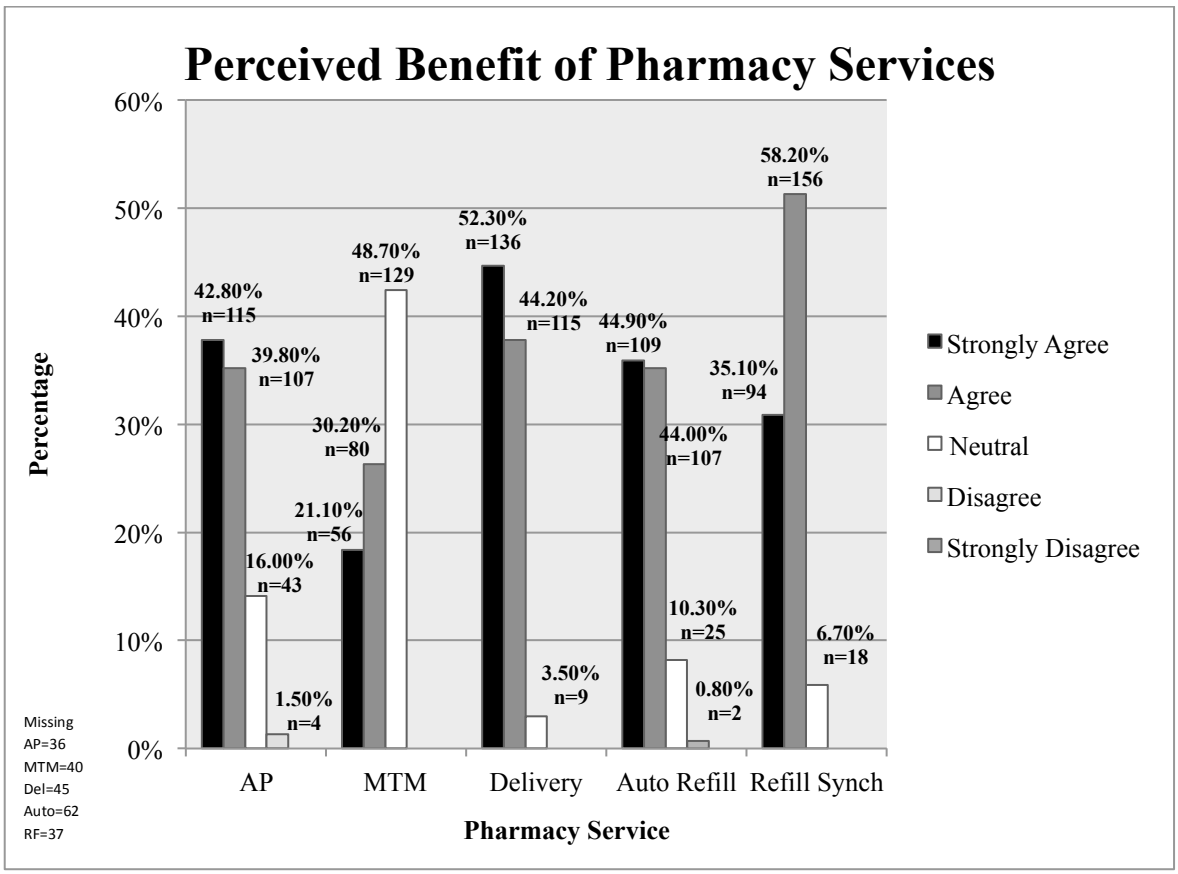

Figure 4.4.2 Frequency Distributions of Patients' perceived Benefits of Pharmacy Services

Most participants either strongly agreed or agreed that adherence packaging, delivery, automatic refill, and refill synchronization could potentially be beneficial to them if they were utilizing them. However, in regards to MTM more than half of the participants neither agreed nor disagreed with the benefits. There were only 4 participants who disagreed that adherence packaging would be beneficial to them and 2 participants who disagreed that automatic refill would be beneficial to them.

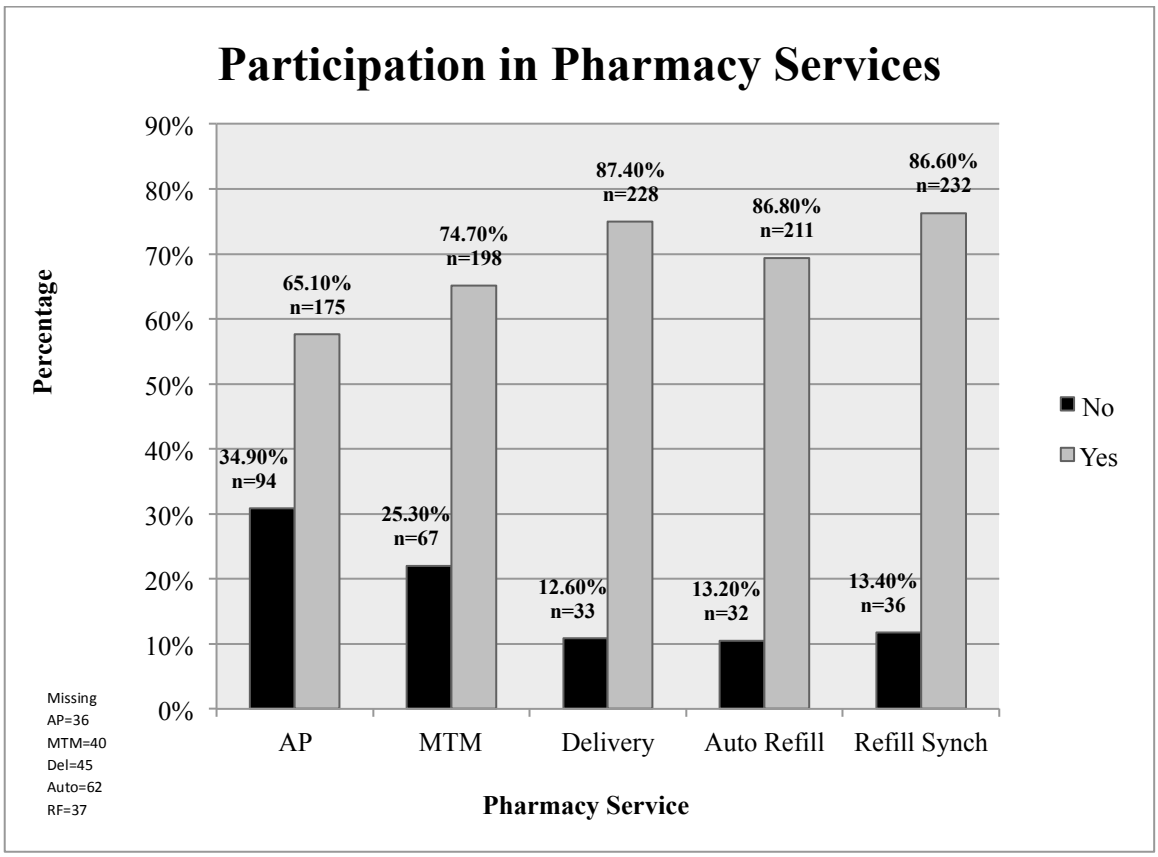

Figure 4.4.3 Frequency Distribution of Patient Intent to Participate in Pharmacy Services

More than 50% of participants would be willing to participate in these services, with refill synchronization being the highest (76.30%) and adherence packaging being the lowest (57.6%).

4.5 Objective 1: To determine the factors affecting patients' perceived benefits of various pharmacy services

Table 4.5.1 Linear Regression to examine factors that contribute to the perceived benefits of pharmacy services

	Adherence packaging		Delivery		Auto Refill		Refill Synch		MTM	
Factors	β	P-value	β	P-value	β	P-value	β	P-value	β	P-value
Gender[a]	0.007	0.909	-0.111	0.092	-0.251	**0.000**	-0.108	**0.000**	-0.077	0.247
Age[b]	0.151	**0.018**	0.120	0.078	-0.132	0.053	0.031	0.645	0.118	0.086
Income[c]	0.274	**0.000**	-0.015	0.832	-0.164	**0.018**	-0.094	0.172	-0.043	0.545
Race[c]	-0.020	0.734	-0.073	0.249	-0.023	0.712	-0.159	**0.014**	-0.016	0.801
Meds	0.130	**0.028**	-0.169	**0.007**	0.016	0.794	0.080	0.206	-0.001	0.984
Edu[d]	-0.075	0.225	0.118	0.069	-0.144	**0.028**	0.027	0.679	0.011	0.871
State[e]	0.119	**0.041**	0.001	0.988	0.085	0.165	-0.056	0.366	-0.021	0.735
Aware[f]	-0.050	0.413	-0.045	0.477	-0.180	**0.004**	0.105	0.097	0.089	0.159
Pharm Loc[g]	0.083	0.152	0.047	0.452	0.077	0.212	0.021	0.728	0.057	0.364
R^2	0.153		0.065		0.144		0.059		0.040	

[a] **0=male 1=female**
[b] **0=not middle aged 1=middle aged (classified as over 45)**
[c] **0= less than $50,000 1=more than $50,000**
[d] **0=white 1=non-white**
[e] **0=less than a bachelor's degree 1=bachelor's degree or higher**
[f] **0=not in Ohio 1=in Ohio**
[g] **0=aware of service 1=not aware of service**
[h] **0=community pharmacy 1=independent**

The results of the linear regression suggest that age (p=0.018), income (p=0.000), state of residence (p=0.041), and the number of medications (p=0.028) the participant is prescribed predicted a significant proportion of the total variation in how participants perceive the benefits of adherence packaging. The number of medications the participant is prescribed also predicted a significant proportion of the total variation in how participants perceive the benefits of delivery (p=0.007). In regards to automatic refill the factors that contributed the most to how patients perceive the benefits are gender (p=0.000), income (p=0.018), education (p=0.028), and awareness (p=0.004). Lastly,

Gender (p=0.000) and race (p=0.014) made the strongest contributions to the variance in how participants perceive the benefits of refill synchronization.

4.6 Objective 2: To determine the patients perceived benefits that predict their interest in participating in a pharmacy service

Table 4.6.1 Logistic Regression analysis to predict perceived benefits in pharmacy services that indicate intent to participate

Service	Benefit	odds ratio	95% Confidence Intervals
Adherence Packaging	Help me take my meds on time	0.829	0.484-1.421
	Help reassure me that I am taking the correct medications	0.715	0.431-1.186
	Help me feel more in control of taking m medications	2.811	**1.668-4.736**
	Improve my satisfaction of the pharmacy	3.098	**1.548-6.201**
	Reduce human error	0.578	**0.368-0.907**
Delivery	Delivery will help me take my meds on time	1.080	0.506-2.307
	Delivery will help me feel more in control of taking my meds	5.148	**1.860-14.249**
	Delivery will allow me more time to do other things	6.899	**2.846-16.723**
	Delivery will improve the satisfaction of the pharmacy	0.664	0.276-4.603
Automatic Refill	Auto refill will help me take my meds on time	8.308	**3.529-19.555**
	Auto refill will help me feel more in control of taking my meds	12.047	**3.314-43.796**
	Auto refill will help remind me to pick up my meds	2.155	0.597-7.787
	Auto refill will improve my satisfaction of the pharmacy	26.533	**4.607-152.823**
Refill Synch	RF will help me take my meds on time	1.750	0.925-3.310
	RF will help me feel more in control of taking my meds	1.598	**1.025-2.491**
	RF will build my relationship with my pharmacist	1.625	0.778-3.396
	Refill synch will allow me time to do other things	0.952	0.517-1.752
	RF will improve my satisfaction of the	4.289	**2.011-9.146**

	pharmacy		
	RF will decrease multiple trips to the pharmacy	2.261	**1.071-4.776**
MTM	Help me take my meds on time	4.756	**1.811-12.493**
	Help reassure me that I am taking the correct medications	3.006	**1.056-8.559**
	Help me understand why I am taking my meds	0.794	0.291-2.166
	Help me feel more in control of taking my meds	2.286	**1.449-3.607**
	Build my relationship with the pharmacist	0.478	**0.306-0.747**

Logistic regression was used to examine the benefits that predict a patient to participate in a service. The significant benefits predicting participation in adherence packaging were feeling more in control of taking their medication (β=2.811), improving their satisfaction of the pharmacy (β=3.098), and helping reduce human error (β=0.578). The significant predictors for participating in delivery are feeling more in control of taking their medications (β=5.148) and allowing them time to do other things (β=6.899). Participants who perceive that automatic refill will help them take their medication on time (β=8.308), feel more in control of taking their medications (β=12.047), and improve satisfaction of their pharmacy (β=26.533) are more likely to participate. The significant benefits predicting participation in refill synchronization were feeling more in control of taking their medication (β=1.598), improving their satisfaction of the pharmacy (β=4.289), and decreasing multiple trips to the pharmacy (β=2.261). Lastly, The significant benefits to predict whether a patient will participate in MTM are helping them take their medication on time (β=4.756), reassuring them that they are taking the correct medication (β=3.006), feeling more in control of taking their medication (β=2.286), and building their relationship with the pharmacist (β=0.478).

Chapter 5

Discussion and Conclusion

This chapter gives a brief discussion regarding the findings in Chapter Four. The discussion is divided into the following sections:

5.1 Demographic Characteristics of the population

5.2 Discussion of study objectives

- 5.2.1 Adherence packaging
- 5.2.2 Medication therapy management
- 5.2.3 Delivery
- 5.2.4 Automatic refill
- 5.2.5 Refill synchronization

5.3 Limitations of the study

5.4 Implications

5.5 Suggestions for future research

5.6 Conclusions from the study

5.2 Demographic Characteristics of the population

Gender

According to the U.S census 2010 the population of the United States is 50.8% female and 49.2% male. [59] According to table 4.3.2, 47% of the participants were female and 53% were male, which is fairly close to the national percentages. This shows that the results of this study may be generalizable to other areas.

Age

Most of the respondents were between the ages of 18-24 and 25-34. Only 19 participants were between the ages of 65-74 and 15 were 75+. Many surveys were collected at the University of Toledo. The average age of a college student is 25, which explains why most of the participants in this study were between the ages of 18-34.

Race

Majority of the participants were Caucasians. A review of the Census 2014 confirmed that nearly 80% of the United States is Caucasian. In this study 78.6% were Caucasian and 13.7% of participants were African American, which was in line with the U.S census.

Education

According to the census 2010-2014, 86.3% of the United States is a high school graduate or higher. Nearly all of the participants that completed the survey received a high school diploma or higher. There is a correlation between education and income, showing the higher the education the more income.[60] The mall and airport are both locations, which require money. This explains why most of the participants had at least a high school diploma.

Income

According to the census 2010-2014 the median household income is $53,482. Specifically in Toledo, the median is $33,485. About half (48.7%) had an annual income of less than $30,000 a year. Considering most of the participants in this study were 18-24 years old this could explain why most participants were making less than $30,000.

5.3 Discussion of study objectives

This section is divided into the following sections, 1) adherence packaging, 2) medication therapy management, 3) delivery, 4) automatic refill, and 5) refill synchronization.

5.3.1 Adherence Packaging

For the purpose of the study, it should be noted that there was a specific picture of an adherence pack that was on the back of the service sheet that was provided to the participant (Appendix D). This allowed the participant to actually visualize what an adherence pack looks like.

It was found that 77% of the participants that were surveyed were unaware that adherence packaging was provided at pharmacies. Adherence packaging is a newer concept, which is gradually being implemented into pharmacies.[54] Even if the pharmacy did offer this service, it could be challenging for them to market, considering most insurance companies may not cover the cost. This could explain why participants who

have a higher income are more likely to see a benefit in adherence packaging compared to those with lower income.

Majority of the participants perceived benefits in adherence packaging. These benefits included feeling in control of taking their medication, improving their satisfaction, and reducing human error. These benefits were significant predictors to participating in adherence packaging, which pharmacies can use to gage patients expectations of a service.

Participants who were middle aged or older and on multiple medications saw a significant benefit in adherence packs. The literature has shown a correlation between age and the number of medications a patient is prescribed. Kaufmen. D.W., et al found that among both men and women middle aged and older was prescribed more medications, which was similar to the findings in this study.[61] Patients with multiple medications are more susceptible to human error which explains why this was a significant benefit that participants perceived. This study found participants who perceived adherence packs will reduce human error were 0.578 times more likely to participate in the service.

Adherence packs are a ready-to-use packaging system that is convenient for the patient. This eliminates the patient transferring their medications from bottles to over the counter pill organizers. Since a pharmacist is organizing the adherence packs and checking them this could make the patient feel more in control of their medications. This study has shown that participants who perceive adherence packs to help them feel more in control of taking their medication were 2.811 times more likely to participate in the service.

Additionally, adherence packs are synching a patients medications together so they receive all their medications at one time each month, which is convenient for the patient. Convenience is an important factor in a pharmacy that could increase or decrease patients' satisfaction.[62] Participants who perceived adherence pack to improve their satisfaction of the pharmacy were 3.098 times more likely to participate in the service. The literature has shown patient satisfaction as an important predictor regarding a patient participating in a service.[62]

It is important to raise awareness of this service to all patients and pharmacies. This can be accomplished by offering pamphlets that describe this packaging option to both patients and to pharmacies. This gives the patient the opportunity to decide for him or herself whether they see a large enough benefit in the service to pay for it. There were 94 participants who were not interested in participating in adherence packaging. Majority of patients responded that they do not want to pay for this packaging and that they are not taking a lot of medications. Patients who are only taking 1-3 medications may not benefit as much from this packaging compared to patients who are taking more than four.

5.3.2 Medication Therapy Management

Medication Therapy Management (MTM) was described on the service sheet as an umbrella term for multiple services including flu shots, smoking cessation, and medication counseling. This could explain why 42.4% of the participants neither agreed nor disagreed in the benefits of MTM. For example, participants may have seen a benefit in medication counseling, however not in flu shots, pushing them to answer neutral.

It was found that 52% of participants were not aware of MTM. Considering OBRA 90 states that pharmacists are required to counsel all patients it was surprising that participants were not aware of this service. This indicates that pharmacists may not be counseling patients in efficient manner or at all. At the same time, this may have been how the service sheet was phrased. If patients were aware of some services listed under MTM but not all services, they could have answered that they were not aware of MTM in general. Additionally, when patients are asked if they would like to speak to the pharmacist regarding their medications most patients are not sure what to ask the pharmacist so they decline. Pharmacists are very busy so it is not uncommon for a pharmacist to spend minimal/if any time talking to a patient about their medications.

Participants who were middle aged or older were more likely to see benefit in MTM compared to participants who were younger. This could be explained that participants who are middle aged or older are possibly taking more medications and are diagnosed with more disease states than younger participants. The older a person the more medications they are usually prescribed.[63]

Participants who perceived MTM will help them take their medication on time, reassure them they are taking the correct medications, help them feel more in control of taking their medications, and build their relationship with their pharmacist were more likely to participate in the service. If pharmacies address the benefits of MTM with their patients then their patients may be more likely to participate.

MTM consists of multiple services as stated above, one of them being medication counseling. A pharmacist will sit down with a patient and go over their medications. The pharmacist will explain how the medications work and how to take the medications. This

could explain why participants who perceived MTM to build their relationship with the pharmacist were 0.478 times more likely to participate. This is most beneficial to the elderly population considering they are usually prescribed more medications. On average a doctor spends 15 minutes with their patients.[64] If a patient, especially someone who is elderly who may take longer to understand their medications, is taking multiple medications then this may not be enough time to explain how to take the medication and what the medication is for. A pharmacist can fill that gap to improve access to care for patients. The personal connection a pharmacist and patient may form through MTM may motivate the patient to remain adherent to their medications since they are aware that their pharmacist is monitoring them. This study has shown that participants who perceived MTM will help them take their medication on time were 4.756 times more likely to participate in the service. Similar studies have shown that patients who are aware their pharmacists are monitoring them may be more adherent to their medication regimen.[65]

There were 67 people who were not interested in participating in MTM. Again, this could have been due to the service sheet. It is possible that there was one service that was included under MTM that a participant was not interested in so the participant answered that they would not want to participate. Majority of people answered that the pharmacist always looks busy and that they do not know what to ask the pharmacist. Both are reasons that have been identified in the literature as being barriers to MTM.[66]

5.3.3 Delivery

Half of the participants surveyed were aware of delivery. Delivery is a service that is offered and marketed more frequently at pharmacies. There is a possibility that participants taking the survey could have mistaken delivery for mail order because it was not specified, which was considered a limitation. This could be the reason for some factors not making a stronger contribution to how the participants perceived the benefits of delivery. Patients on multiple medications saw a large benefit in delivery because it will decrease the number of trips the participant has to make to the pharmacy. In turn, this will allow the patient to spend more time doing other things. Participants who perceived delivery to allow them more time to do other things were 6.899 times more likely to participate in the service.

Age was the second highest contributor to how patients perceived the benefits of delivery. Participants who were middle aged and older were more likely to see a benefit in delivery than those who were younger. As mentioned above older people are more likely to be prescribed more medications, which may explain why they may see a larger benefit in delivery. Delivery is beneficial for patients who are unable to drive, the elderly, or patients who do not have time to pick up their prescriptions. Three fourths of the participants were interested in participating in delivery. Participants who were not interested in participating in delivery stated that they were scared that their medication would not arrive on time or that they would get stolen because they are not home a lot.

Implementing delivery into a pharmacy may require additional staff considering someone may always be traveling to make home deliveries to patients. This would

require the pharmacy to restructure and come up with a process to ensure patients receive their medications on time and they are being delivered to the correct locations.

5.3.4 Automatic refill

Participants were the most aware of automatic refill, however participants who were aware of automatic refill were less likely to see a benefit. It has been shown that there have been communication errors between pharmacies and physician offices regarding prescription refills.[67] If a physician is telling the patient to call directly to the doctor's office instead of the pharmacy first, which may be a red flag to the patient that they pharmacy cannot be trusted with refilling prescriptions on time.

The literature states that 28% of patients forget to order their refills,[68] with automatic refill not only does the service fill the prescription for you, but they also call/text and remind you that your prescription is ready to be picked up, which is a convenience for the patient. Overall, convenience is an important factor in regards to a patient perceiving a benefit in a service. If a patient thinks a service is convenient then they are likely to participate, which will improve the patients' satisfaction of the pharmacy.

Participants who had a lower income and less education were more likely to see a benefit in automatic refill. Research based on decades of experience has identified education status as a major predictor of health outcomes.[69] Montez et al documented a negative relationship between years of education and mortality risk for less than high school graduation. This research identified the years of education and health as a linear relationship. Considering most of the population in this study made less than $30,000 this

could explain why both income and education was a predictor of how patients perceived the benefits of automatic refill.

Even though participants were the most aware of automatic refill there is room to improve the marketing and utilization of the service. Having posters hanging up in the pharmacy offering the service may not be enough. By verbally asking the patients for their perceptions on this service and informing them of the benefits then the patients may be more likely to participate.

5.3.5 Refill synchronization

Refill synch can be difficult to implement in a pharmacy, for example the pharmacy workflow will have to be reorganized, the best monthly fill date for the patient will have to be determined, and plan coverage issues related to early and partial refills will have to be managed. Hence, this service may not be marketed or implemented in pharmacies as much as automatic refill may be. More than 70% of the participants saw a benefit in refill synch, which was the service that participants saw the most benefit in.

Gender and race made the strongest contributions to the variance in how participants perceive the benefits of refill synchronization. Female participants were less likely to see a benefit in refill synchronization compared to males. The literature has shown that men are more likely to participate in services and be more adherent to their medication than females.[70] Considering males are more adherent than females they may see a larger benefit in refill synchronization since it has shown to improve patients' adherence. Of the participants that were surveyed 78.6% were white, the results show that non-white participants saw more of a benefit in refill synch. It has also been shown in a

study regarding adherence, that patients who are non-white tend to be less adherent compared to those who are white, meaning that they may see more of a benefit in this service.

Participants who perceived refill synch to help them feel more in control of taking their medications, improve their satisfaction of the pharmacy, and decrease multiple trips to the pharmacy each month were more likely to participate. This service will be most beneficial to patients who are on multiple medications or live far away from their pharmacy. Considering this service makes it convenient for the patient it may improve the patients satisfaction of the pharmacy as a whole.

Of the participants that were surveyed 76% are interested in participating in refill synchronization. The reasons participants were not interested in participating is because they were not on a lot of medications and they do not want to pay for all of their co-pays one time each month. To overcome the difficulties in implementing refill synchronization pharmacies could rework their workflow and start with a smaller population or a pilot study.

5.4 Limitations of the study

As with other studies, this study had some limitations. The service sheet that was provided to the participant with the description of the five services could have been rephrased to better reflect the service. MTM was described as an umbrella term to multiple services. These services should have been separated to better understand the benefits of MTM. This could have been the reason most patients neither agreed nor disagreed in the benefits MTM. There was also only one picture of an adherence pack

that participants could use to reference when in practice there are many different adherence packages. Lastly, participants could have confused the concept of delivery and mail order, for that was not made clear on the service sheet.

5.5 Implications

Patients should be well informed of the services that are offered at their pharmacy and have full access of utilization. If patients are aware of these services at their pharmacy, they can participate with a hope to reach personal and clinical goals. This study may provide evidence to assist pharmacies in catering these services to specific populations of patients. Additionally, this study will determine which benefits patients perceive as most important to them. These benefits can be used by pharmacies to market the services to their patients considering the benefits identified in this study were predicting the patients' intent to participate.

5.6 Suggestions for future research

This research heavily studied the benefits construct in The Health Belief model. Although, barriers were studied the question was left open ended to the patient, which did not entirely measure the ability to determine whether a patient would participate in the service or not. By assessing both benefits and barriers quantitatively it would better measure the patients' intent to participate in a service. The HBM as a whole measures the participants' intent to participate in a service. For future research, it would be interesting to see how the different constructs contribute to a patient participating in a pharmacy

service. This would help address the issue of patients lacking in utilization of pharmacy services.

5.7 Conclusions from the study

In conclusion, this study showed some very valuable results. The goal of this study was to assess patients perceived benefit in pharmacy services and if they were willing to utilize the service on a regular basis. As seen from the results and discussion above, patients perceive these services to be very beneficial. Patients see the most benefit in being able to feel in control of taking their medications. If they perceive a service to help them feel more in control of taking their medication then they are more likely to participate. This was statistically significant for all five services. It is important for pharmacies to assess patients' perceptions of pharmacy services to see if patients find them valuable. If patients find the service valuable then the pharmacy can implement the service and market it to the patient.

Additionally, raising awareness in patients about pharmacy services is important. Pharmacists can make patients more aware about such services when they come to fill or refill their prescriptions at a pharmacy. Secondly, physicians can assist in making the patient aware about services that are offered in a pharmacy. This will assure the patient that the physician is recommending them, which is showing a relationship of trust between the physician and pharmacist. Educational programs or campaigns can serve as another method to raise public awareness about these services. Providing pamphlets at the pharmacy for the patient to take home with them and review and marketing the services on the pharmacy website could be beneficial.

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Appendix A

Perceptions of Pharmacy Services

Directions: Please do not put your name or any identification on the survey. Your responses are strictly **confidential**. Your responses will not be able to be traced back to you. Please refer to the **laminated hand out** for the description of pharmacy services. The purpose of this survey is to examine;

- ❖ Your awareness of pharmacy services
- ❖ Your perceived benefit these services will have on your health
- ❖ Your interest in participating in these service

1. When is the last time you filled a prescription at your pharmacy?
   - o 1-3 months ago
   - o 4-6 months ago
   - o 7-9 months ago
   - o 10-12 months ago
   - o Over a year ago

IF THE LAST TIME YOU FILLED A PRESCRIPTION AT YOUR PHARMACY IS MORE THAN 6 MONTHS AGO, PLEASE SKIP TO PAGE 7

2. Are you **AWARE** of the following community based pharmacy services? (Description of services are on the laminated hand out) Please check Yes or No.

	Yes	**No**
Adherence Packaging		
Medication Therapy Management (MTM) counseling		
Delivery		
Automatic Refill		
Refill Synchronization		

3. Please answer the following questions regarding your opinion of **adherence packaging…** (If you already use this service please skip to question 6). Check one column in each row.

		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
a.	Adherence packs will help me take my medications on time					
b.	Adherence packs will help reassure me that I am taking the correct medications					
c.	Adherence packs will help me feel more in control of taking my medications					
d.	Adherence packs will improve my satisfaction of the pharmacy					
e.	Adherence packs will reduce human error if I transfer medications to a pill organizer					

4. Would you be interested in participating in **adherence packaging**? Please check yes or no.
   - o Yes
   - o No

5. *If you answered **no** above, please check or write the biggest reason as to why you do not want to participate. (If you answered yes above please skip to question 6)*

   - o They seem big and bulky
   - o I am comfortable using pill bottles
   - o I don't want to pay for this packaging
   - o I am not taking a lot of medications
   - o Other_____

6 Please answer the following questions regarding your opinion of **MTM counseling** Check one column in each row. (If you use this service please skip to question 9).

		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
a.	MTM will help me take my medications on time					
b.	MTM will help reassure me that I am taking the correct medications					
c.	MTM will help me understand why I am taking my medications					
d.	MTM will help me feel more in control of taking my medications					
e.	MTM will build my relationship with my pharmacist					
f.	MTM will improve my health					
g.	MTM will improve my satisfaction of the pharmacy					

7 Would you be interested in participating in **MTM**? Please check yes or no.

- o Yes
- o No

8

*If you answered **no** above, please check or write the biggest reason as to why you do not want to participate. (If you answered yes above please skip to question 9)*

- o I don't have time to talk to my pharmacist
- o Pharmacist always looks busy
- o I don't trust my pharmacist
- o I trust my physician to provide me with all the information I need
- o I don't know what to ask my pharmacist

- o Other_____

9 Please answer the following questions regarding your opinion of **delivery** of medications (If you use this service please skip to question 12). Check one column in each row.

		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
a.	Delivery will help me take my medications on time					
b.	Delivery will help me feel more in control of taking my medications					
c.	Delivery allow me more time to do other things					
d.	Delivery will improve my satisfaction of the pharmacy					

10 Would you be interested in participating in **Delivery**? Please check yes or no.

- o Yes
- o No

11

*If you answered **no** above, please check or write the biggest reason as to why you do not want to participate. (If you answered yes above please skip to question 12)*

- o I don't trust they will deliver my medications on time
- o I don't want someone to steal my medications when they are in route
- o Other_____

12 Please answer the following questions regarding your opinion of **automatic refill** (If you use this service please skip to question 15). Check one column in each row.

		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
a.	Automatic refill will help me take my medications on time					
b.	Automatic refill will help me feel more in control of taking my medications					
c.	Automatic refill will help remind me to pick up my medications					
d.	Automatic refill will improve my satisfaction of the pharmacy					

13 Would you be interested in participating in **automatic refill**? Please check yes or no.

- o Yes
- o No

14

*If you answered **no** above, please check or write the biggest reason as to why you do not want to participate. (If you answered yes above please skip to question 15)*

- o I don't trust they will refill my prescriptions on time
- o I need to wait until I get paid to order my medications

- o Other_____

15 Please answer the following questions regarding your opinion of **refill synchronization** (If you use this service please skip to question 18). Check one column in each row.

		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
a.	Refill synch will help me take my medications on time					
b.	Refill synch will help me feel more in control of taking my medications					
c.	Refill synch will build my relationship with my pharmacist					
d.	Refill synch will allow me more time to do other things					
e.	Refill synch will improve my satisfaction of the pharmacy					
f.	Refill synch will decrease multiple trips to the pharmacy each month					

16 Would you be interested in participating in **refill synchronization?** Please check yes or no.

- o Yes
- o No

17 *If you answered **no** above, please check or write the biggest reason as to why you do not want to participate. (If you answered yes above please skip to question 18)*

- o I don't want to pay for all of my medication co-pays at one time
- o I am not taking a lot of medications

- o Other_____

18. What pharmacy do you fill your medications at?

_____

19. What is your gender?
- Male
- Female

20. What is your age?
- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65-74 years old
- 75 years or older

21. What is your ethnicity?
- White
- Hispanic or Latino
- Black or African American
- Native American or American Indian
- Asian/Pacific Islander
- Other

22. What is your household income?
- <$30.000
- $30,000-$50,000
- $50,000-$75,000
- $75,000-$100,000
- >$100,000

23. What is you education?
- Some high school
- High school graduate/GED
- Some college
- Associate degree
- Bachelors degree
- Masters degree
- Doctorate degree
- None

24. How many medications are you currently prescribed?
- 0
- 1-3
- 4-6
- 7-9
- 10-12
- <13

25. What state do you currently reside?

_____

Appendix B

Script

First Contact

Hi, my name is _____ would you mind filling out this survey. It is on your opinion of various pharmacy services. Your answers remain completely anonymous and we ask that you **do not** put your name anywhere on the survey. It will only take a few minutes, and I would really appreciate it.

If participant wants to fill out survey

Thank you! Descriptions of each service are on the attached sheet.

Denied

Thank you for your time. Do you mind filling out the last page for research purposes?

Denied Again

That's OK I appreciate it, have a nice day

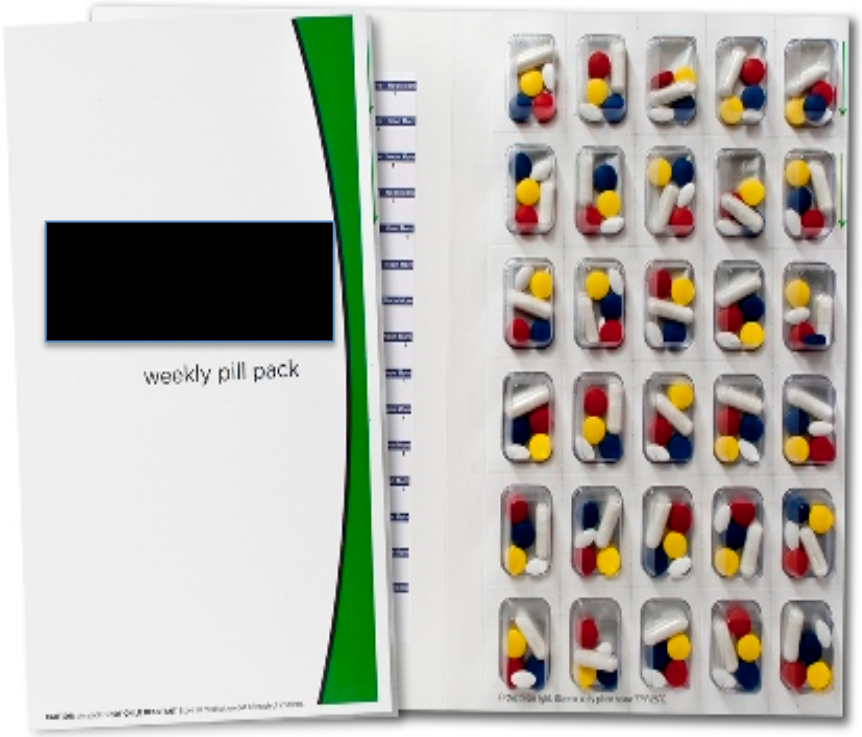
Appendix C

Service	Perception
MTM	"My pharmacist always looks busy, if I could have a sit down conversation I would get a lot of my questions answered that I have had for a while"
Adherence Packaging	"You would be a millionaire if you invented this, I hate separating my medications into my pill organizer"
Refill Synchronization	-"That is a thing?" -"I am on 7 different medications, do you know how much easier my life would be with only one trip to the pharmacy each month"
Automatic Refill	"I always forget to order my medications almost every month, I am always picking my medications up late"
Delivery	-"There are pharmacies that deliver?" -"I have a hard time moving around, driving to the pharmacy is a hassle for me"

Appendix D

Service	Description
Blister Packaging	• Each Pack contains a week supply of medications • The pack is separated daily into morning, afternoon, evening, and bedtime • Easy tear edges to rip off medications for travel • Medication list is on back of blister pack • All medications in the blister are to be taken at one time • Picture on back
Medication Therapy Management	• Medical care provided by pharmacists whose aim is to improve drug therapy and overall health for patients. • Flu shots • Smoking cessation • Pharmacist counsels patient on drug interactions, how to take medications properly, diet and exercise, etc.
Delivery	• Pharmacy delivers medications to patients' home instead of patient picking up medications at pharmacy.
Automatic Refill	• The pharmacy will refill the prescription for the patient, without patient involvement. • The pharmacy will call the patient when the refill is ready to be picked up/delivered.
Refill Synchronization	• A strategy in which ALL medications that a patient is taking are organized by the pharmacy to be picked up/delivered at the same time • Decreases multiple trips to the pharmacy each month for the patient

Appendix E



Appendix F

	Benefit		Freq. N=
Adherence Packaging (Missing=36)	Help me take my meds on time	Strongly agree	**128**
		Agree	**92**
		Neutral	**26**
		Disagree	**23**
		Strongly disagree	**0**
	Help reassure me that I am taking the correct medications	Strongly agree	**75**
		Agree	**111**
		Neutral	**65**
		Disagree	**17**
		Strongly disagree	**1**
	Help me feel more in control of taking my medications	Strongly agree	**108**
		Agree	**110**
		Neutral	**29**
		Disagree	**22**
		Strongly disagree	**0**
	Improve my satisfaction of the pharmacy	Strongly agree	**14**
		Agree	**129**
		Neutral	**99**
		Disagree	**27**
		Strongly disagree	**0**
	Reduce human error	Strongly agree	**14**
		Agree	**127**
		Neutral	**49**
		Disagree	**65**
		Strongly disagree	**14**

Delivery (Missing=44)	Delivery will help me take my meds on time	Strongly agree	**136**
		Agree	**94**
		Neutral	**22**
		Disagree	**7**
		Strongly disagree	**1**
	Delivery will help me feel more in control of taking my meds	Strongly agree	**58**
		Agree	**103**
		Neutral	**90**
		Disagree	**7**
		Strongly disagree	**2**
	Delivery will allow me more time to do other things	Strongly agree	**1**
		Agree	**3**
		Neutral	**12**
		Disagree	**111**
		Strongly disagree	**133**
	Delivery will improve the satisfaction of the pharmacy	Strongly agree	**3**
		Agree	**7**
		Neutral	**94**
		Disagree	**131**
		Strongly disagree	**25**
Automatic Refill (Missing=61)	Auto refill will help me take my meds on time	Strongly agree	**77**
		Agree	**111**
		Neutral	**14**
		Disagree	**36**
		Strongly disagree	**5**
	Auto refill will help me feel more in control of taking my meds	Strongly agree	**89**
		Agree	**61**
		Neutral	**85**
		Disagree	**4**
		Strongly disagree	**4**
	Auto refill will help remind me to pick	Strongly agree	**111**

	up my meds	Agree	**85**
		Neutral	**44**
		Disagree	**3**
		Strongly disagree	**0**
	Auto refill will improve my satisfaction of the pharmacy	Strongly agree	**110**
		Agree	**86**
		Neutral	**44**
		Disagree	**2**
		Strongly disagree	**1**
Refill Synch (Missing=36)	RF will help me take my meds on time	Strongly agree	**95**
		Agree	**78**
		Neutral	**87**
		Disagree	**7**
		Strongly disagree	**1**
	RF will help me feel more in control of taking my meds	Strongly agree	**57**
		Agree	**67**
		Neutral	**30**
		Disagree	**82**
		Strongly disagree	**32**
	RF will build my relationship with my pharmacist	Strongly agree	**90**
		Agree	**85**
		Neutral	**84**
		Disagree	**3**
		Strongly disagree	**6**
	Refill synch will allow me time to do other things	Strongly agree	**121**
		Agree	**126**
		Neutral	**14**
		Disagree	**3**
		Strongly disagree	**4**
	RF will improve my satisfaction of the pharmacy	Strongly agree	**136**
		Agree	**112**
		Neutral	**18**

		Disagree	**2**
		Strongly disagree	**0**
	RF will decrease multiple trips to the pharmacy	Strongly agree	**101**
		Agree	**83**
		Neutral	**78**
		Disagree	**2**
		Strongly disagree	**4**
MTM (Missing=39)	Help me take my meds on time	Strongly agree	**25**
		Agree	**98**
		Neutral	**126**
		Disagree	**3**
		Strongly disagree	**13**
	Help reassure me that I am taking the correct medications	Strongly agree	**22**
		Agree	**29**
		Neutral	**213**
		Disagree	**1**
		Strongly disagree	**0**
	Help me understand why I am taking my meds	Strongly agree	**33**
		Agree	**100**
		Neutral	**118**
		Disagree	**2**
		Strongly disagree	**12**
	Help me feel more in control of taking my meds	Strongly agree	**87**
		Agree	**149**
		Neutral	**16**
		Disagree	**10**
		Strongly disagree	**3**
	Build my relationship with the pharmacist	Strongly agree	**45**
		Agree	**80**
		Neutral	**16**
		Disagree	**123**

		Strongly disagree	**1**