

9-21-2016

## Patients' Awareness, Perceived Benefit, and Intent to Participate in Pharmacy Services

Alexandra L. Born

*The University of Toledo*, [alexandra.born@utoledo.edu](mailto:alexandra.born@utoledo.edu)

Dr. Sharrel L. Pinto

*The University of Toledo*, [sharrel.pinto@utoledo.edu](mailto:sharrel.pinto@utoledo.edu)

Dr. Amit S. Patel

[apatel@m2econ.com](mailto:apatel@m2econ.com)

Dr. Sadik A. Khuder

*The University of Toledo*, [sadik.khuder@utoledo.edu](mailto:sadik.khuder@utoledo.edu)

Dr. Varun A. Vaidya

*The University of Toledo*, [varun.vaidya@utoledo.edu](mailto:varun.vaidya@utoledo.edu)

Follow this and additional works at: <http://pubs.lib.umn.edu/innovations>

### Recommended Citation

Born AL, Pinto DL, Patel DS, Khuder DA, Vaidya DA. Patients' Awareness, Perceived Benefit, and Intent to Participate in Pharmacy Services. *Inov Pharm*. 2016;7(3): Article 10. <http://pubs.lib.umn.edu/innovations/vol7/iss3/10>

INNOVATIONS in pharmacy is published by the University of Minnesota Libraries Publishing.

---

# Patients' Awareness, Perceived Benefit, and Intent to Participate in Pharmacy Services

## **Cover Page Footnote**

## Patients' Awareness, Perceived Benefit, and Intent to Participate in Pharmacy Services

Alexandra L Born, MS Candidate 2016<sup>1</sup>, Graduate Research Assistant<sup>2</sup>; Sharrel L Pinto, BSPHarm, PhD, Division Head, Associate Professor<sup>1</sup>, and Director<sup>2</sup>; Amit S Patel, BSPHarm, PhD, Director<sup>4</sup>; Sadik A Khuder, BDS, MPH, PhD, Associate Professor<sup>3</sup>; Varun A Vaidya, BSPHarm, PhD, Associate Professor<sup>1</sup>

<sup>1</sup>Health Outcomes and Socioeconomic Sciences, University of Toledo College of Pharmacy and Pharmaceutical Sciences; <sup>2</sup>Center for Pharmaceutical Care and Outcomes Research, University of Toledo College of Pharmacy and Pharmaceutical Sciences; <sup>3</sup>Departments of Medicine and Public Health, University of Toledo; <sup>4</sup>Medical Marketing Economics, LLC

**Authors' note:** This study has been presented as a poster at the American Pharmacists Association Annual Meeting, Baltimore, MD, March 3-7, 2016.

**Conflict of Interest:** We declare no conflicts of interest or financial interests that the authors or members of their immediate families have in any product or service discussed in the manuscript, including grants (pending or received), employment, gifts, stock holdings or options, honoraria, consultancies, expert testimony, patents and royalties

**Financial disclosure:** There was not any funding for this research.

### Abstract

**Objective:** To determine patient awareness, perceived benefit, and intent to participate in 1) adherence packaging 2) Medication therapy management (MTM), 3) delivery, 4) automatic refill, and 5) refill synchronization.

**Methods:** This cross-sectional exploratory study used convenience sampling to survey participants from January 26<sup>th</sup>, 2016 and March 28<sup>th</sup>, 2016. A 25-question survey and service sheet were developed. The survey consisted of four sections 1) awareness, 2) perceived benefit, 3) intent to participate, and 4) demographics. Descriptive statistics, linear regression, and logistic regression were conducted.

**Results:** A total of 336 people were approached. Thirty-four people only filled out the demographic section and 32 refused to participate. Therefore, 270 surveys were considered usable for statistical analysis (90.4% response rate). The majority of the participants were not aware of refill synchronization (77.0%), MTM (64.8%), and adherence packaging (87.0%). There were multiple factors that contributed to how patients perceived the benefits of adherence packaging and automatic refill. Participants who were middle aged or older ( $p < .05$ ), had a higher income ( $p < .01$ ), were on multiple medications ( $p < .01$ ), and from Ohio ( $p < .05$ ) saw a higher benefit in adherence packaging. Participants who were middle aged or older ( $p < .05$ ), male ( $p < .01$ ), had a higher income ( $p < .01$ ), had a Bachelor's degree or lower ( $p < .05$ ), and were aware of the service ( $p < .01$ ) were more likely to see a benefit in automatic refill. In contrast there was only one predictor for refill synchronization showing that non-white participants were more likely to see a benefit. There were not any factors that contributed to how patients perceived the benefits of delivery, refill synch, and MTM.

There were several predictors that increased a patient's intent to participate in a service. Some of the key predictors for each service included, participants who felt that adherence packaging will help them feel more in control of taking their medications were 2.81 times more likely to participate. Participants who felt that delivery would allow them more time to do other things were 6.89 times more likely to participate. Those who believed that automatic refill would help them take their medications on time were 8.30 times more likely to participate. Participants who felt refill synchronization would decrease multiple trips to the pharmacy were 2.26 times more likely to participate. Those that felt MTM would build their relationship with their pharmacist were 0.47 times more likely to participate. Overall, a consistent predictor for every service was feeling in control of taking their medications.

**Conclusion:** Overall, there is a lack of awareness of pharmacy services. Specifically services such as medication therapy management, refill synchronization, and adherence packaging. Pharmacists should take a proactive approach in informing patients of the services offered at their pharmacy. Additionally to increase participation, pharmacists can educate patients on how a service may help them feel more in control of taking their medications.

---

**Corresponding author:** Alexandra Born  
University of Toledo  
3000 Arlington Ave, Toledo, OH 43614  
Phone :( 419)-304-7088  
Email: [Alexandra.born@utoledo.edu](mailto:Alexandra.born@utoledo.edu)

## INTRODUCTION

Due to the Affordable Care Act (ACA), health insurance coverage has expanded to include an additional 34 million people in the United States, increasing the use of all physicians by 4%.<sup>[1,2]</sup> As a result of this increase, physicians are seeing more patients and may not have enough time to counsel them on their medications. Patients with complex medication regimens require a higher level of counseling to help them understand their regimen and improve their medication taking behavior.<sup>[3]</sup> Due to these changes, pharmacies have opportunities to offer more services, which can help improve patients' medication taking behavior and improve patient outcomes.<sup>[4]</sup>

Pharmacists play a key role in providing patient centered services to their patients because they are accessible and knowledgeable about medications. These pharmacy services include but are not limited to minute clinics, compounding, screenings, anticoagulation management, mail order, and pharmacogenomics. However, pharmacies are now offering services specifically targeting different aspects of a patients' medication taking behavior. These services include medication therapy management,<sup>[5]</sup> adherence packaging,<sup>[6]</sup> delivery,<sup>[7]</sup> refill synchronization,<sup>[8]</sup> and automatic refill.<sup>[7,8]</sup>

These services have shown to improve various clinical, economic, and humanistic outcomes by specifically targeting various aspects of a patient's medication taking behavior. Medication non-adherence is a multi-faceted problem and a precursor for poor patient outcomes and increasing health care costs.<sup>[9]</sup> Changing a patients' medication taking behavior can directly impact their adherence, satisfaction, accessibility, and consequentially their clinical outcomes.<sup>[10]</sup> For example, Medication Therapy Management (MTM) allows the pharmacist to educate the patient about their medications and therapy, identify and resolve problems, and make recommendations to the physician.<sup>[11]</sup> 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.<sup>[12,13]</sup> Adherence packs adopt a process known as refill synchronization, which can also be done with pill bottles. Refill synchronization involves a pharmacist synching a patients' medications so they are filled at one time, minimizing multiple trips to the pharmacy for the patient.<sup>[14]</sup> Delivery and automatic refill are more common services seen in pharmacies. Delivering medications assists patients who do not have transportation to the pharmacy or are consistently forgetting to pick up their medications.<sup>[15]</sup> Automatic refill is a program in which the pharmacy refills the prescription for the patient, so the patient does not have to remember to contact the pharmacy each time they need a refill.<sup>[16]</sup>

Services provided at a pharmacy have shown to have a large impact on patient outcomes<sup>[17,18]</sup> and are consistently being implemented at various pharmacies.<sup>[19,20]</sup> However, patients are either unaware of the existence of these services,<sup>[21]</sup> don't see them as being beneficial,<sup>[22]</sup> or are unaware of how to utilize them.<sup>[23]</sup>

## OBJECTIVES

1. To determine patients' awareness of the pharmacy service\*
2. Determine the factors affecting patients' perceived benefits of the pharmacy service
3. Identify perceived benefits that predict patients' intent to participate in the pharmacy service

\* Pharmacy services assessed in this study include adherence packaging, MTM, refill synchronization, automatic refill, and delivery. For each service the above objectives will be used.

## METHODS

### Survey

This was a survey based cross-sectional study. To be included, participants had to be 18 years of age or older, filled a prescription within the last 6 months, and were willing to fill out the survey. The survey was tested for validity using factor analysis and reliability using Cronbach's alpha. Based on the scree plot, a forced extraction was conducted on five factors. The factor loadings loaded appropriately and the survey was considered valid. 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.

A 25-question survey was created. The questions of the survey were based off of elicitation interviews that were conducted. The survey first inquired when the patient last refilled a prescription, if the participant answered more than six months ago, then they were directed to the demographics section and the survey ended. If the patient filled a prescription within the last six months, then they were asked to continue. The 25-question survey consisted of four sections 1) awareness, 2) perceived benefit, 3) intent to participate, and 4) demographics. Awareness of the service was measured on a dichotomous yes or no scale. Perceived benefits were measured on a 5-point likert scale for each service, in which 4-6 questions were asked. The 5-point likert scale ranged from strongly disagree to strongly agree. These questions measured patients' perceptions of each pharmacy service. The intent to participate was measured on a dichotomous yes or no scale. The demographics sections included items such as age, income, number of medications, awareness, ethnicity, education, gender, and state.

Additionally, a service sheet was created that included a list of the services mentioned above and a description for each service, including a list of the MTM services. The participant judged whether they were aware, perceived a benefit, and would consider utilizing MTM based on the list. Additionally, a picture of an adherence pack was on the back on the sheet so participants could visualize the packaging. This sheet allowed the participant to form an opinion about the service and perceive potential benefits.

#### **Data Collection**

Participants were approached at The Westfield Franklin Park Mall in Toledo Ohio, the baggage claim at The Detroit Metropolitan Wayne County Airport, and main/health science campuses at The University of Toledo.

Graduate students assisted in the data collection process and were given a script to ensure consistency. Data was collected between January 26<sup>th</sup>, 2016 and March 28<sup>th</sup>, 2016.

#### **Data Analysis**

For objective one, descriptive statistics were used to assess the participants' awareness of each of the pharmacy services listed above. Objective two was measured using linear regression with the independent variable being the factors (age, income, number of medications, state, type of pharmacy, ethnicity, awareness, education, and gender). The dependent variable was the perceived benefit of the service. Objective three was measured using logistic regression with the independent variable being the benefits of the pharmacy service, including questions on taking medications on time, improving satisfaction of the pharmacy, feeling more in control of taking medications, reducing human error, and improving the relationship with the pharmacist. The dependent variable being the participant's intent to participate.

#### **RESULTS**

A total of 336 people were approached. Thirty-four surveys only had the demographic section filled out and 32 people refused to participate. The most common reason participants declined participation was because they did not have the time. Therefore, 270 surveys were considered usable for statistical analysis (90.4% response rate). Of the 270 participants 51.9% were male and 48.1% were female. Forty five percent were between 18-34, forty four percent were taking between 1-3 medications, forty six percent were making less than \$30,000, forty seven percent received a Bachelor's degree, 11.5% received a master's degree/Doctorate, and 41.5% received less than a Bachelors. Seventy seven percent of the participants were white and from Ohio.

#### **Awareness of pharmacy services**

Majority of the participants were not aware of refill synchronization (77.0%), MTM (64.8%), and adherence packaging (87.0%). Participants were mostly aware automatic refill (74.8%) and delivery (50%), with automatic refill being the service participants were the most aware of.

#### **Factors affecting participants' perceptions of pharmacy services**

The results of the linear regression shown in table 1 suggest that age ( $p < .05$ ), income ( $p < .01$ ), state of residence ( $p < .05$ ), and the number of medications ( $p < .05$ ) prescribed predicted a significant proportion to how the participant perceived the benefits of adherence packaging. In regards to automatic refill the factors that contributed the most to patients perceptions of the benefits were gender ( $p < .01$ ), age ( $p < .05$ ), income ( $p < .01$ ), education ( $p < .05$ ), and awareness ( $p < .01$ ). Lastly, race ( $p < .01$ ) was the strongest predictor in regards to the benefits of refill synchronization.

#### **Intent to participate**

Logistic regression shown in table 2 examined the benefits that predict a patient's intent to participate. Participants who felt adherence packaging would help them feel more in control of taking their medications were 2.81 times more likely to participate. If they felt adherence packs would help them improve their satisfaction of the pharmacy they were 3.09 more likely to participate. Lastly, if the participant felt that this service would help them reduce human error they were 0.57 times more likely to participate.

The participants who felt delivery would help them feel more in control of taking their medications were 5.14 times more likely to participate. Additionally, if they felt delivery would allow them time to do other things they were 6.89 times more likely to participate.

Participants who perceived that automatic refill would help them take their medication on time were 8.308 times more likely to participate. Also, if they felt more in control of taking their medications they were 12.04 times more likely to participate. Lastly, if they felt automatic refill would improve their overall satisfaction of the pharmacy they were 26.53 times more likely to participate.

Participants who felt refill synchronization would help them feel more in control of taking their medications were 1.598 times more likely to participate. If they felt refill synch would improve their overall satisfaction of the pharmacy they were 4.28 times more likely to participate. Lastly, if they felt that automatic refill would decrease multiple trips to the pharmacy they were 2.26 times more likely to participate.

Lastly, participants who felt MTM would help them take their medication on time were 4.75 times more likely to participate. If they felt this service would reassure them that they are taking the correct medications they are 3.00 times more likely to participate. Additionally, if they felt more in control of taking their medications they were 2.28 times more likely to participate. Lastly, if they felt MTM will help build their relationship with their pharmacist they were 0.47 times more likely to participate.

## DISCUSSION

### **Adherence Packaging**

It was found that 87% of participants surveyed were unaware that adherence packaging was provided at pharmacies. Adherence packaging is a newer concept, which is gradually being implemented.<sup>[24]</sup> If a pharmacy offers this service patients typically have to pay out of pocket, since most insurance companies do not cover the cost. This could explain why majority of the participants surveyed responded that they do not want to pay for this packaging. Also, this study found that participants who have a higher income are more likely to see a benefit in adherence packaging compared to those with lower income.

Participants middle aged or older and on more than three medications saw a significant benefit in adherence packs. Additionally, participants who were not prescribed as many medications did not see a benefit in adherence packaging. Literature has shown a correlation between age and the number of medications a patient is prescribed.<sup>[25]</sup> Patients on multiple medications may experience complex drug regimens,<sup>[26]</sup> medication non-adherence,<sup>[26]</sup> and a possible increase of drug interactions.<sup>[26]</sup> Hence, the patient may feel they are more susceptible to human error, leading them to not feel in control of their medications. Adherence packs are a ready-to-use packaging system that is convenient for the patient. Adherence packs are created by pharmacists eliminating the need for a patient to incorrectly transfer their medications from bottles to over the counter pill organizers. Overall, may reduce the possibility of human error due to a patient filling their own pill organizers, and help the patient feel more in control of taking their medication. This study found that patients who feel more in control of taking their medications are 2.811 times more likely to participate.

Additionally, adherence packs are syncing a patients medications together so they receive all their medications at one time each month. This makes it convenient for the patient so they do not have to go to the pharmacy multiple times to pick up their medications. Convenience is an important factor in a pharmacy that could increase or decrease patients' satisfaction.<sup>[27]</sup> The literature has shown patient satisfaction as an important predictor regarding a patient participating in a service.<sup>[27]</sup> According to this study,

participants who believed adherence packs improve their satisfaction of the pharmacy were 3.098 times more likely to participate.

### **Medication Therapy Management**

Sixty-five percent of participants surveyed were not aware of medication therapy management (MTM). The number of pharmacies implementing MTM has tremendously grown over the past few years.<sup>[28]</sup> Despite this, it was interesting to find that 65% of participants were not aware of MTM. There are many services that could be considered MTM including flu shots, smoking cessation, and medication counseling. Several of these services were listed on the service sheet under MTM (Appendix A). While patients may have received these services at their pharmacies and may be aware of their existence, they may not have been referred to as MTM.

Additionally literature suggests, when patients are asked if they would like to speak to the pharmacist most patients are not sure what to ask, so they most often decline.<sup>[29]</sup> Most participants in this study stated the main reason for not wanting to participate in MTM was that the pharmacist always looked busy and that they did not know what to ask the pharmacist. Furthermore, participants who felt that MTM would improve their relationship with their pharmacist were 0.478 times more likely to participate. While several pharmacists want to provide these services to patients, patients may still have to be made aware of the benefits these services can offer. It may be helpful to ask patients direct questions about their medications or offer advice specific to their medications or therapy as opposed to asking them if they had any general questions. This would not only help with improving awareness of the services but also help foster a meaningful and ongoing patient-pharmacist relationship, thereby improving participation.

MTM's are especially beneficial to elderly patients and those that are on multiple chronic medications.<sup>[30]</sup> It was therefore interesting to note that participants who were middle aged or older and on multiple medications were more likely to see benefit in MTM. On average a doctor spends 15 minutes with their patients.<sup>[31]</sup> All patients require different treatment so some may need more time at the doctor's office. Literature has shown that patients on multiple medications tend to forget or mix-up the instructions that were given to them at their doctors.<sup>[32]</sup> This may lead the patient to not feel in control of taking their medications. An MTM counseling session consists of a pharmacist counseling a patient on how to take their medications, why they are taking their medication, and when to take their medications. This could explain why participants in this study who believed MTM will help them feel more in control of taking their medication were 2.28 times more likely to participate and those who

believed MTM will help them take their medication on time were 4.756 times more likely to participate.

### **Delivery**

Participants were more aware of the delivery service than some of the other services listed in this study. More recently, several pharmacies are offering delivery options to their patrons. This service is especially beneficial for the elderly and patients in rural communities, which represent nearly 25% of the United States population, with a large percentage of patients being older and relying heavily on medications.<sup>[33]</sup> Participants in this study, who were middle aged and older, were more likely to see a benefit in delivery than those who were younger. Delivery decreases multiple trips to the pharmacy for the patient. In turn, this will allow the patient to have more free time. Participants who believed delivery would allow them free time were 6.899 times more likely to participate in the service.

Furthermore, participants who stated delivery will help them feel more in control of taking their medications were 5.14 times more likely to participate. Patients who are elderly and live in rural communities are less adherent than those in urban communities.<sup>[33]</sup> Most times patients don't like making multiple trips to the pharmacy and therefore are late at getting their medications filled. Delivery services allow the patient the opportunity to get their medications on time without leaving their home. They can feel more in control of taking their medication and being adherent to them without the hassle of making several trips to the pharmacy.

### **Automatic refill**

It was found that 74.8% of participants were aware of automatic refill. Participants that were younger and had lower income were more likely to see a benefit in this service. It is possible that those that were younger are busy or have more responsibilities. Automatic refill will save the participant from having to remember to make a phone call to refill their prescriptions. Additionally, participants who are lower income may likely be working multiple jobs, so they may not remember to call in their prescriptions. This could explain why lower income participants saw a benefit in automatic refill.

Participants surveyed who believed that automatic refill would help them take their medications on time were 8.3 times more likely to participate in the service. Approximately 28% of patients forget to fill their prescriptions.<sup>[3]</sup> This can lead to non-adherence and patients not being in control of taking their medications. As seen in this study, feeling more in control of taking their medication was an important predictor for participating in automatic refill.

### **Refill synchronization**

Seventy seven percent of participants surveyed were not aware of refill synchronization. In 2016, the Ohio senate passed HB116 unanimously, which allows pharmacies to partially refill prescriptions for a patient to synch their medications. HB116 will greatly improve patient medication adherence, reduce hospitalizations, and simplify the prescription refill process for pharmacists and patients.<sup>[3]</sup> In turn, this will help the patient feel more in control of taking their medication, especially if they are prescribed multiple medications. Participants who believed refill synchronization will help them feel more in control of taking their medications were 1.59 times more likely to participate in the service.

Furthermore, 69 million Americans take between 1-3 medications per month, requiring multiple trips to the pharmacy.<sup>[14]</sup> Concurrently, many patients skip multiple trips resulting in periods of time within a month when they are out of one or more of their medications. Participants who believed that this service would decrease multiple trips to the pharmacy were 2.26 times more likely to participate. When talking to a patient about refill synchronization, pharmacists or pharmacy staff may see an increased intent in participation, if they are able to explain this benefit of synching a patient's medications to them.

### **LIMITATIONS**

As with other studies, this study had some limitations. On the service sheet, MTM was described as an umbrella term for multiple services including medication counseling, flu vaccinations, smoking cessation, etc. 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 when asked about the benefits of 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, a majority of patients were from Ohio. Participants from other states may have different perceptions about the services being offered.

### **CONCLUSION**

Overall, this study identified various factors and benefits that can predict a patients' intent to participate in the services offered by pharmacies. 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 take a proactive role in helping patients see the value these services can offer them. Marketing strategies, both large scale (TV or

newspaper ads etc.) or small scale (pamphlets, word-of-mouth at the pharmacy counter etc.) should both focus on including the unique benefits each of these services offered to patients.

As pharmacies look for unique ways to distinguish their business models and provide services that help improve patient outcomes, it will be important to continually educate and increase awareness of these services to patients that will ultimately be utilizing them. While pharmacists understand the value these innovative services have to offer, continuing to help their patients see the value and benefits of these services have to offer will be paramount to the sustainability of these services in the future.

#### FUTURE RECCOMENDATIONS

This research focused on benefits of specific pharmacy services. Although, barriers were studied the question was left open ended. This did not allow for a more thorough assessment of what barriers prevented patients from participating in these services. Assessing benefits and barriers quantitatively would provide a better understanding of the patients' intent to participate in a service. As patient-centered services continue to increase, it would be essential for pharmacies to continue to asses patients' intent to participate in services and identify barriers that result in under utilization of these services.

#### REFERENCES

- Petterson, S.M., et al., *Projecting US primary care physician workforce needs: 2010-2025*. Ann Fam Med, 2012. 10(6): p. 503-9.
- Kasch, R., et al., *[Physician Shortage: How to Prevent Generation Y From Staying Away - Results of a Nationwide Survey]*. Zentralbl Chir, 2015.
- Jimmy, B. and J. Jose, *Patient medication adherence: measures in daily practice*. Oman Med J, 2011. 26(3): p. 155-9.
- Paolini, N. and M.J. Rouse, *Scope of contemporary pharmacy practice: Roles, responsibilities, and functions of pharmacists and pharmacy technicians Executive summary*. Am J Health Syst Pharm, 2010. 67(12): p. 1030-1.
- Marin, D.B., et al., *Relationship between chaplain visits and patient satisfaction*. J Health Care Chaplain, 2015. 21(1): p. 14-24.
- Kooy, M.J., et al., *Patients' general satisfaction with telephone counseling by pharmacists and effects on satisfaction with information and beliefs about medicines: Results from a cluster randomized trial*. Patient Educ Couns, 2015. 98(6): p. 797-804.
- Naik Panvelkar, P., B. Saini, and C. Armour, *Measurement of patient satisfaction with community pharmacy services: a review*. Pharm World Sci, 2009. 31(5): p. 525-37.
- Holdford, D. and K. Saxena, *Impact of Appointment-Based Medication Synchronization on Existing Users of Chronic Medications*. J Manag Care Spec Pharm, 2015. 21(8): p. 662-9.
- Bosworth, H.B., et al., *Medication adherence: a call for action*. Am Heart J, 2011. 162(3): p. 412-24.
- Wu, J.R., et al., *Effect of a medication-taking behavior feedback theory-based intervention on outcomes in patients with heart failure*. J Card Fail, 2012. 18(1): p. 1-9.
- Lewin, G., *Medication therapy management services: a critical review*. J Am Pharm Assoc (2003), 2005. 45(5): p. 580-7.
- Huang, H.Y., et al., *Impact of pill organizers and blister packs on adherence to pill taking in two vitamin supplementation trials*. Am J Epidemiol, 2000. 152(8): p. 780-7.
- Schneider, P.J., J.E. Murphy, and C.A. Pedersen, *Impact of medication packaging on adherence and treatment outcomes in older ambulatory patients*. J Am Pharm Assoc (2003), 2008. 48(1): p. 58-63.
- Holdford, D.A. and T.J. Inocencio, *Adherence and persistence associated with an appointment-based medication synchronization program*. J Am Pharm Assoc (2003), 2013. 53(6): p. 576-83.
- Eder-Van Hook, J., *The benefits and challenges of technology in the delivery of home health care in rural America*. Caring, 2006. 25(1): p. 66-7.
- Helmons, P.J., A.J. Dalton, and C.E. Daniels, *Effects of a direct refill program for automated dispensing cabinets on medication-refill errors*. Am J Health Syst Pharm, 2012. 69(19): p. 1659-64.
- Renedo, A. and C. Marston, *Developing patient-centred care: an ethnographic study of patient perceptions and influence on quality improvement*. BMC Health Serv Res, 2015. 15: p. 122.
- Truong, H.A., et al., *Perceptions of patients on Medicare Part D medication therapy management services*. J Am Pharm Assoc (2003), 2009. 49(3): p. 392-8.
- Ross, A., et al., *Sync and swim: the impact of medication consolidation on adherence in Medicaid patients*. J Prim Care Community Health, 2013. 4(4): p. 240-4.
- Bunting, B.A., B.H. Smith, and S.E. Sutherland, *The Asheville Project: clinical and economic outcomes of a community-based long-term medication therapy management program for hypertension and dyslipidemia*. J Am Pharm Assoc (2003), 2008. 48(1): p. 23-31.



21. Mansell, K. and J. Perepelkin, *Patient awareness of specialized diabetes services provided in community pharmacies*. Res Social Adm Pharm, 2011. 7(4): p. 396-405.
22. Naidu, A., *Factors affecting patient satisfaction and healthcare quality*. Int J Health Care Qual Assur, 2009. 22(4): p. 366-81.
23. McDonough, R.P. and W.R. Doucette, *Using personal selling skills to promote pharmacy services*. J Am Pharm Assoc (2003), 2003. 43(3): p. 363-72; quiz 373-4.
24. Dupclay, L., et al., *Real-world impact of reminder packaging on antihypertensive treatment adherence and persistence*. Patient Prefer Adherence, 2012. 6: p. 499-507.
25. Kaufman, D.W., et al., *Recent patterns of medication use in the ambulatory adult population of the United States: the Slone survey*. JAMA, 2002. 287(3): p. 337-44.
26. Brown, M.T. and J.K. Bussell, *Medication adherence: WHO cares?* Mayo Clin Proc, 2011. 86(4): p. 304-14.
27. Mohamed, B. and N.A. Azizan, *Perceived service quality's effect on patient satisfaction and behavioural compliance*. Int J Health Care Qual Assur, 2015. 28(3): p. 300-14.
28. Wang, J., et al., *Trends in Medicare Part D Medication Therapy Management Eligibility Criteria*. Am Health Drug Benefits, 2015. 8(5): p. 247-55.
29. Shaya, F.T., et al., *Impact of a comprehensive pharmacist medication-therapy management service*. J Med Econ, 2015: p. 1-10.
30. Burge, S., et al., *Correlates of medication knowledge and adherence: findings from the residency research network of South Texas*. Fam Med, 2005. 37(10): p. 712-8.
31. Tai-Seale, M., T.G. McGuire, and W. Zhang, *Time allocation in primary care office visits*. Health Serv Res, 2007. 42(5): p. 1871-94.
32. Joosten, E.A., et al., *Systematic review of the effects of shared decision-making on patient satisfaction, treatment adherence and health status*. Psychother Psychosom, 2008. 77(4): p. 219-26.
33. Hourihan, F., I. Krass, and T. Chen, *Rural community pharmacy: a feasible site for a health promotion and screening service for cardiovascular risk factors*. Aust J Rural Health, 2003. 11(1): p. 28-35.

Table 1. Simple Linear Regression to examine factors that contribute to the perceived benefits of Pharmacy Services

Factors	Adherence packaging		Delivery		Auto Refill		Refill Synch		MTM	
	$\beta$	P-value	$\beta$	P-value	$\beta$	P-value	$\beta$	P-value	$\beta$	P-value
Gender <sup>a</sup>	0.013	0.836	-0.119	0.070	-0.251	<b>0.000</b>	-0.101	0.121	-0.078	0.238
Age <sup>b</sup>	0.144	<b>0.024</b>	0.124	0.074	-0.145	<b>0.032</b>	0.040	0.561	0.109	0.112
Income <sup>c</sup>	0.253	<b>0.000</b>	-0.016	0.827	-0.166	<b>0.017</b>	-0.088	0.211	-0.805	0.421
Race <sup>c</sup>	-0.022	0.705	-0.079	0.223	-0.022	0.726	-0.161	<b>0.013</b>	-0.283	0.777
Meds	0.172	<b>0.005</b>	-0.112	0.086	0.050	0.436	0.031	0.634	.950	0.343
Edu <sup>d</sup>	-0.065	0.288	0.113	0.087	-0.145	<b>0.025</b>	0.026	0.689	0.017	0.794
State <sup>e</sup>	0.131	<b>0.024</b>	-0.013	0.840	0.090	0.143	-0.053	0.385	-0.019	0.759
Aware <sup>f</sup>	-0.059	0.324	-0.041	0.524	-0.180	<b>0.004</b>	0.112	0.078	0.088	0.161
Pharm Loc <sup>g</sup>	0.079	0.169	0.052	0.404	0.076	0.219	0.019	0.758	0.057	0.364
R <sup>2</sup>	0.172		0.059		0.155		0.049		0.035	

<sup>a</sup> 0=male 1=female

<sup>b</sup> 0=not middle aged 1=middle aged (classified as over 45)

<sup>c</sup> 0= less than \$50,000 1=more than \$50,000

<sup>d</sup> 0=white 1=non-white

<sup>e</sup> 0=less than a bachelor's degree 1=bachelor's degree or higher

<sup>f</sup> 0=not in Ohio 1=in Ohio

<sup>g</sup> 0=aware of service 1=not aware of service

<sup>h</sup> 0=community pharmacy 1=independent

Table 2. Logistic Regression analysis to predict perceived benefits in adherence packing that indicate intent to participate

Service	Benefit	Odds ratio (CI)
Adherence Packaging	Help me take my meds on time	0.83 (0.48-1.42)
	Help reassure me that I am taking the correct medications	0.71(0.43-1.18)
	Help me feel more in control of taking my medications	2.81( <b>1.66-4.73</b> )
	Improve my satisfaction of the pharmacy	3.09 ( <b>1.54-6.20</b> )
	Reduce human error if I transfer pills to a pill organizer	0.57 ( <b>0.36-0.90</b> )
Delivery	Delivery will help me take my meds on time	1.08 (0.50-2.30)
	Delivery will help me feel more in control of taking my meds	5.14 ( <b>1.86-14.24</b> )
	Delivery will allow me more time to do other things	6.89 ( <b>2.84-16.72</b> )
	Delivery will improve the satisfaction of the pharmacy	0.66 (0.27-4.60)
Automatic Refill	Auto refill will help me take my meds on time	8.30 ( <b>3.52-19.55</b> )
	Auto refill will help me feel more in control of taking my meds	12.04 ( <b>3.31-43.79</b> )
	Auto refill will help remind me to pick up my meds	2.15 (0.59-7.78)
	Auto refill will improve my satisfaction of the pharmacy	26.53 ( <b>4.60-152.82</b> )
Refill Synch	RF will help me take my meds on time	1.75 (0.92-3.31)
	RF will help me feel more in control of taking my meds	1.59 ( <b>1.02-2.49</b> )
	RF will build my relationship with my pharmacist	1.62 (0.77-3.39)
	Refill synch will allow me time to do other things	0.95 (0.51-1.75)
	RF will improve my satisfaction of the pharmacy	4.28 ( <b>2.01-9.14</b> )
	RF will decrease multiple trips to the pharmacy	2.26 ( <b>1.07-4.77</b> )
MTM	Help me take my meds on time	4.75 ( <b>1.81-12.49</b> )
	Help reassure me that I am taking the correct medications	3.00 ( <b>1.05-8.55</b> )
	Help me understand why I am taking my meds	0.079 (0.29-2.16)
	Help me feel more in control of taking my meds	2.28 ( <b>1.49-3.60</b> )
	Build my relationship with the pharmacist	0.47 ( <b>0.30-0.74</b> )

## APPENDIX A

Service	Description
Blister Packaging	<ul style="list-style-type: none"> <li>• Each Pack contains a week supply of medications</li> <li>• The pack is separated daily into morning, afternoon, evening, and bedtime</li> <li>• Easy tear edges to rip off medications for travel</li> <li>• Medication list is on back of blister pack</li> <li>• All medications in the blister are to be taken at one time</li> <li>• Picture on back</li> </ul>
Medication Therapy Management	<ul style="list-style-type: none"> <li>• Medical care provided by pharmacists whose aim is to improve drug therapy and overall health for patients.</li> <li>• Flu shots</li> <li>• Smoking cessation</li> <li>• Pharmacist counsels patient on drug interactions, how to take medications properly, diet and exercise, etc.</li> </ul>
Delivery	<ul style="list-style-type: none"> <li>• Pharmacy delivers medications to patients' home instead of patient picking up medications at pharmacy.</li> </ul>
Automatic Refill	<ul style="list-style-type: none"> <li>• The pharmacy will refill the prescription for the patient, without patient involvement.</li> <li>• The pharmacy will call the patient when the refill is ready to be picked up/delivered.</li> </ul>
Refill Synchronization	<ul style="list-style-type: none"> <li>• 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</li> <li>• Decreases multiple trips to the pharmacy each month for the patient</li> </ul>