Integrating Pharmacist MTM Services into Medical Clinics as Part of a Health Department Partnership Project

Wesley Nuffer, PharmD[1], Leigh Dye, PharmD[2], Samantha Decker, RD[2]
[1]University of Colorado Skaggs School of Pharmacy & Pharmaceutical Sciences; [2] Tri-County Health Department

Abstract

Introduction: *Medication therapy management (MTM) services are an essential way for pharmacists to provide cognitive services to patients and receive reimbursement. Traditional MTM delivery has been identified as suboptimal, often done by telephone without any provider-patient relationship. New ways for delivering MTM need to be explored to optimize the pharmacist's role in this area and help establish the pharmacist as an essential part of the interprofessional team.*

Methods: *A local public health department partnership with regional medical offices integrated pharmacist MTM services on site as part of patients' routine medical care. Referral criteria were established to identify patients who would be good candidates for services. Efforts were made to provide the initial consultation in the medical office, with follow-up consults being based upon patient preferences.*

Results: *Over a 3-year period, 180 patients received 361 pharmacy MTM consultations, averaging 40 minutes in length. A comprehensive medication review was performed on 87% of patients receiving these consults. The pharmacy team identified 719 medication-related problems, and improved participating patients' adherence rates. Pharmacy recommendations were accepted as is or modified by providers 55% of the time. Patients reported high satisfaction with the pharmacy services.*

Conclusions: *A novel pharmacist MTM program integrated into provider offices demonstrated a positive impact on the clinics and on patients served, and successfully overcame barriers to successful MTM completion.*

Keywords: community pharmacy, student pharmacist, medication therapy management, public health department, interprofessional

INTRODUCTION

Interprofessional collaborative practice has widely been adopted as a care model that improves patient outcomes and improves efficiencies within the United States health care system.[1] There are numerous examples in the literature of interprofessional collaborations positively impacting patient outcomes, communication in the medical office, and overall patient care.[1-3] These positive results have prompted health science colleges and universities to establish and integrate interprofessional education (IPE) into various health professions' curricula. In the case of pharmacy, intentional IPE is now an accreditation requirement for all US schools of pharmacy.[4] This has led to tremendous growth in pharmacists and student pharmacists participating in various IPE practice models, with many best practices highlighted and specific outcomes, core competencies and IPE goals identified for prospective student pharmacists participating in this education.[5-7]

Corresponding author: Wesley Nuffer, PharmD
University of Colorado Skaggs
School of Pharmacy & Pharmaceutical Sciences
12850 E Montview Blvd C238, Aurora, CO 80045
Email: Wesley.Nuffer@cuanschutz.edu

There is now strong evidence documenting the important role of the pharmacist within the interprofessional team.[8-10] One challenge faced by pharmacist practitioners outside of large medical centers, however, is the ability to participate in interprofessional care with a physical practice site that may be located several miles away from the medical center and the rest of the interprofessional team. Much of the work done by community pharmacists falls under the umbrella of medication therapy management (MTM). Software systems utilize specific criteria to help identify candidates who would benefit from pharmacy services, and the pharmacist provides medication-related counseling and education focused on improving the patient's therapy, reducing costs, preventing adverse drug reactions, and improving adherence. MTM services have opened up opportunities for pharmacists to provide billable cognitive services to patients and contribute to improving patients' health. Many of these interventions occur in isolation, however, without the rest of the medical team knowing what has been done and how the care fits into the patient's overall care plan. Several prescription drug plans offer MTM services centrally by telephone consult, where there is no established relationship between the patient and the pharmacist providing the consultation.[11] Patients are sometimes confused about the pharmacist's role in providing cognitive MTM services, and may view these interventions as being redundant to the care they receive at the medical office. Current pilot programs are exploring an enhanced MTM model with purposeful intentions

DOI: https://doi.org/10.24926/iip.v10i4.2129

to better engage community pharmacists that have pre-established relationships with their patients and improve rates of face to face interactions.[11] Efforts need to be made to better integrate the MTM services provided by pharmacists into the patient's overall care plan, to avoid duplications or redundancies and to increase awareness of the pharmacy services the patient is receiving. There are examples of pharmacists working directly with providers and utilizing medical records to help guide their interventions and communicate services back to the medical team.[12-14] Most of these, however, occur in large health system settings, not outpatient medical clinics. Integrating the pharmacy team into the clinic as part of the patient's medical visit offers several advantages over other modes of delivery. This manuscript reports outcomes on a public health partnership where pharmacy MTM services were directly integrated into participating medical clinic settings.

METHODS

This project was designated "exempt" by the Colorado Institutional Review Board. The Colorado Tri-County Health Department (TCHD) received funding support to establish a multidisciplinary community health team with a prioritized focus on diabetes, hypertension, and medication therapy management. This team worked to develop partnerships with outpatient medical clinics in the 3-county area, offering specialty services in the prioritized disease states to patients being seen at each clinic. Participating medical offices would integrate members of the TCHD team on site to provide chronic disease services as part of the patient's routine office visit. The pharmacy team was responsible for the MTM component of the services, and consisted of a pharmacist funded 10-15 hours per week along with dedicated 4th year student pharmacists on rotation. A manuscript focused on the educational model and student pharmacists' roles and responsibilities within this project has been previously published.[15] Referral criteria were established to prioritize pharmacy MTM services to the patients with the greatest need in each clinic due to limited pharmacist availability. Providers were also allowed to directly refer specific patients for an MTM consult, however, or the patients could "opt-in" if they needed pharmacy assistance. Priority was given to patients with the pre-specified disease states in diabetes or cardiovascular disease. A one-page handout was also developed for the dieticians and nurses on the TCHD team, so that they better understood the goals and benefits of MTM consultation and could promote these to the patients. The pharmacy team provided an initial consultation closely modeled after the comprehensive medication review (CMR) as defined by Medicare, with an emphasis on improving patient adherence and identifying and resolving any medication-related problems (MRPs). Identified MRPs were classified by the pharmacist on the potential significance of the issue, based upon potential outcomes that could occur as a result if no changes were made. MRPs that were relatively common and only required closer monitoring were designated as "somewhat significant", and those with a likelihood of causing an unwanted side effect or potential secondary problem and addressing the problem would likely be beneficial to the patient were coined "significant". Finally, those MRPs that posed serious risks to the patient and needed to be addressed expediently were considered "very significant". The initial consultation primarily took place in the medical clinic, usually as part of the patient's routine examination, to optimize face-to-face delivery of education and not require additional trips for the patient. Adherence was assessed utilizing the Voils standardized adherence scale, and patients with identified adherence problems were provided with various strategies to improve their adherence, such as pill boxes, alarms, phone applications, or therapy changes.[16] Any recommendations to the other providers in the office following the initial consultation were made utilizing a Pharmacist/Provider Communication form through secure fax or email, or in the case of very significant problems, face to face discussions were held if the medical provider was accessible to expedite necessary changes. Examples of recommendations made by the pharmacy team included serious adherence issues, drug changes or discontinuations to resolve the MRPs, or referrals for services needed from a different member of the team. The prescriber would respond to the Communication form indicating implementation as is or with modifications or outright rejection of the recommendation. The provider would also document if the patient required further follow-up with them in regards to the identified problem. Patients who required follow-up from their initial consultation could choose whether to meet the pharmacy team again in person or receive communications by telephone or email. These follow-up consults were typically much shorter in duration and focused on any changes made to the patient's therapy. All non-urgent findings and summary of the initial visit would be sent to the provider in a 30, 60 or 90 day patient care plan based on provider preference. These care plans would be updated and sent on a scheduled basis until the patient was discharged from the program.

Patient lab values were retrieved from the medical record and requested if they were missing. Table 1 lists blood pressure and hemoglobin A1c measurements before the pharmacy MTM interventions and after the interventions for participating patients. Statistical analysis was performed on these using the Wilcoxon signed-rank test (SAS Analytics Software, Cary, NC).

RESULTS

In total, 367 patients met criteria for a MTM referral across the 3-year funding period. Of these, 180 patients (49%) successfully enrolled into the MTM services. Patients who did not enroll included those who declined services because they did not perceive a need to meet with the pharmacy team, along with those with logistic problems such as transportation challenges, rescheduled appointments that were not attended, or those patients who could not be reached. Messaging became more consistent across the TCHD team as the program continued, resulting in improved enrollment in the final year. Within the population of 180 participating patients, there were 361 medication therapy management consults provided. The

DOI: https://doi.org/10.24926/iip.v10i4.2129

pharmacy team successfully provided the initial consultation at the patient's medical clinic for 134 patients (74% of those enrolled). Approximately one-third (31%) of these patients were enrolled in Medicare and 11% were enrolled in Colorado Medicaid. Patients on average received 2 MTM consultations, with a range from 1 to 8 consultations across the population. Table 1 highlights those patients with chronic disease states of diabetes and/or hypertension that received MTM services. There were 107 patients with a diagnosis of hypertension who participated in pharmacy services, representing 23% of all hypertensive patients in the full TCHD program. Similarly, 127 patients receiving services were diagnosed with diabetes, representing approximately 20% of all diabetes patients seen through the TCHD program. Participating patients' systolic blood pressure statistically improved from baseline measures before the pharmacy intervention. Diastolic blood pressure and A1C changes trended down but were not statistically significant. Individual specific weight data were not available for analysis.

Across all MTM consults, a total of 719 medication-related problems (MRPs) were identified by the pharmacy team. There were 326 changes to patients' medication regimens recommended (45%) as a result of these problems, with 221 (68%) requiring provider authorization for change. Across these MRPs, 309 (43%) were designated "somewhat significant", 217 (30%) were designated "significant", and 44 (6%) were designated "very significant", based upon potential bad outcomes for the patient if no change was made. Additionally, prescription drug cost savings were identified by the pharmacy team and implemented in 112 cases across the three-year program. These costs were either direct to the patient or a higher cost to health plans, with the majority being elimination of unnecessary drugs, opting for a lower tiered copay option or the utilization of prescription drug discount programs.

Figure 1 outlines providers' responses to pharmacy recommendations that occurred during the medication therapy management consultations. A follow-up with the provider was recommended for 56 patients, or 25% of all of the consultations completed. In those patients where a follow-up was not required, the provider accepted pharmacy recommendations as is or with modifications 76% of the time. Included in the rejection group of data were any recommendations made where there was no data indicating whether the recommendation was approved. Reasons why a recommendation was not accepted included reluctance by the patient to start a new medication regimen, insurance formulary requirements, or laboratory measurements needed before a change could occur. Also, in some cases providers did not return communication forms, patients were lost to follow up or patients had yet to schedule an appointment to implement changes at the conclusion of the program.

The pharmacy team spent 203 hours of direct patient care to provide these patient consultations. The initial consultation lasted between 60-90 minutes on average, while follow-up consults averaged about 15 minutes in length. Additional time requirements on the pharmacy team, which included scheduling, travel to participating offices, documentation and follow-up from each encounter averaged around 120 minutes. Health-related quality of life questionnaires were given to participants within the TCHD cohort, including those who participated in the MTM consultations. Those patients who responded at both baseline and after receiving services are outlined in Table 2. Of note, this was a voluntary survey that was not sent to the patient until they completed all elements of the TCHD program. In some cases, this was months after they may have received MTM services, which could explain the lower response rate. The PHQ4 scale, a validated 4-item patient health questionnaire tool used to evaluate anxiety and depression, was also disseminated to participants. Data from patients who responded at baseline and after receiving services are also presented in Table 2. A global assessment question was asked to all participants who received pharmacy services, stating "*The pharmacy team provided support that was helpful to me.*" 99% of the responders (87/88) rated the statement *agree* or *strongly agree.* Qualitative feedback regarding pharmacy services was very positive. A few example statements included "(*the pharmacy team) is so caring and informative, teaching at its best!*" and *"I learned a ton and have materials to look back on if I have questions."*

DISCUSSION

This manuscript summarizes elements of integrated pharmacy services into medical offices as part of a larger collaboration between a local health department and several medical clinics. Establishing a model where a pharmacist could provide MTM services onsite in an outpatient facility as part of the overall medical consultation offers several advantages. The pharmacy team was able to access the patient's medical chart and review their medical care as part of the assessment of the patient. Medication-related problems that were designated as very significant could be followed up upon before the patient left the clinic. Patients in most cases were able to receive the initial MTM consult as part of their overall visit, avoiding the need to schedule additional appointments or arrange transportation to another location. The established Pharmacist/Provider Communication form helped inform the rest of the medical team what was covered during the MTM encounter and any MRPs or adherence issues that were identified. These advantages have allowed pharmacists within large hospitals and health systems to have a positive impact on patient outcomes, but is relatively rare in outpatient medical clinics.[12-14] There were a number of benefits identified through this integration of pharmacy services. Patients rated the care they received from the pharmacy team very highly, both in quantitative tools and in qualitative statements. They also understood the pharmacist's role as part of the care team better than traditional models where patients receive services

DOI: https://doi.org/10.24926/iip.v10i4.2129

at the pharmacy, or when contracted pharmacists from a prescription drug plan contact their member by telephone. Patients who were referred for MTM services from their provider may have viewed the importance of receiving these services more importantly, since it was directly recommended as part of their medical care.

Due to limitations in the pharmacy team's time, criteria had to be established to prioritize what patients would receive MTM services, with an emphasis on those patients diagnosed with diabetes or cardiovascular disease. Based upon Table 2, 69% of the patients receiving interventions rated their overall health as "good" or less. This is consistent with national data, which suggest that pharmacists' interventions are most valuable in a complex patient population, where patients often report their disease impacting them strongly and affecting their ability to perform activities they enjoy.[17,18] If this program was sustained beyond the funding period, additional work to determine what populations would most benefit from the on-site MTM counseling (such as elderly populations or those patients on five or more medications) would be a necessary step, particularly if the pharmacist time available was limited. Implementing the use of additional data collection tools and laboratory measurements routinely collected before and after the pharmacy interventions could also better illustrate the impact of the pharmacy services, and could lead to greater physician uptake of the services. Looking at the changes in laboratory values for the participating patients in table 1, only systolic blood pressure changes were statistically significant. Considering the overall provider acceptance of recommendations, (Figure 1) a 30% initial acceptance and an overall 55% acceptance rate is consistent with other pharmacy programs.[19] These numbers also included patients who were lost to follow up, or those who were still waiting for a follow up appointment with their provider, where these recommendations may have been addressed. Nevertheless, it does suggest that there is substantial room for improvement, and further research could examine the nature of the various recommendations and the reasons for providers to decline them.

There were several important limitations to this project. The analysis was retrospective in nature, so there were no pre-specified primary and secondary outcomes established for the pharmacy interventions. There was no control group to compare with those patients who received MTM services, and as such there is no way to attribute any improvement in patient health outcomes to the services rendered. Important measures such as quantifying the impact of the adherence interventions or obtaining regular laboratory values before and after the pharmacy interventions were not readily available, further weakening the overall impact that can be demonstrated. Since the project was conducted across several medical clinics, there was no systematic way to track why patients were or were not being referred and why only around 50% of those patients identified as eligible ultimately engaged with services. The limited funded time available for the pharmacist to dedicate to the project also limited the scope of what could have been accomplished. Not every medical clinic approached by the Tri-County Health Department entered into a partnership with this organization to utilize the various services offered, so it is possible that those clinics who accepted the agreement had a greater need for resources or were more open to personnel assisting in the care of their patients. Also, not every provider in the partnering offices made referrals for MTM services. Finally, all of these clinics that partnered with the health department were geographically located in Denver or surrounding areas, so it is unknown whether this model would perform well in other areas, such as rural communities. Further data need to be collected to explore whether medical offices could benefit by hiring a clinical pharmacist as part of their overall care team, and whether the cost savings produced by that person would more than offset their salary requirements. The total time involved to deliver these services becomes an important consideration when considering the sustainability of the model. Patient satisfaction surveys were voluntary and only given at the completion of all TCHD services. It would have been much more effective to deliver a satisfaction survey specific to the MTM services and deliver it directly after the patient completed their consultations.

This manuscript presents a novel method for delivering MTM services to patients. It has been widely observed that the current delivery of MTM is suboptimal, and that improvements need to be made to the process.[11,20] Key components identified to improve the process include better engagement with the patient's pharmacist and provider, which this model accomplished. The manuscript also highlights the role of a local health department in providing valuable educational resources and integrating them as part of the patient's usual care at the medical office.

CONCLUSION

Integrated MTM services provided on-site to local medical offices as part of a public health partnership had positive impacts on those clinics, and on the patients served. Placing a pharmacist into the clinic as part of the medical visit may overcome certain barriers seen with current MTM delivery.

Funding/support: This project was supported through funding from the Colorado Department of Public Health and Environment

Conflicts of interests: There are no conflicts of interest to report for any of the authors or partners on this project.

DOI: https://doi.org/10.24926/iip.v10i4.2129

REFERENCES

1. Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: effects of practice-based interventions on professional practice and healthcare outcomes. *Cochrane Database Syst Rev.* 2009(3):CD000072.
2. Rosenberg K. Interprofessional Collaborative Practice Model Improves Staff Communication, Patient Care. *Am J Nurs.* 2018;118(3):70.
3. Reeves S, Goldman J, Zwarenstein M. An emerging framework for understanding the nature of interprofessional interventions. *J Interprof Care.* 2009;23(5):539-542.
4. Accreditation Council for Pharmacy Education. Accreditation Standards and Key Elements For the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree "Standards 2016". 2016; https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf. Accessed 8/29/2019.
5. Bridges DR, Davidson RA, Odegard PS, Maki IV, Tomkowiak J. Interprofessional collaboration: three best practice models of interprofessional education. *Med Educ Online.* 2011;16.
6. Zwarenstein M, Reeves S. Knowledge translation and interprofessional collaboration: Where the rubber of evidence-based care hits the road of teamwork. *J Contin Educ Health Prof.* 2006;26(1):46-54.
7. Interprofessional Education Collaborative. Core Competencies for Interprofessional Collaborative Practice: 2016 Update. 2016; https://s3.amazonaws.com/aspph-wp-production/app/uploads/2014/04/IPEC-2016-UpdatedCoreCompetencies-Report-FINAL-RELEASE.pdf. Accessed 8/29/2019.
8. Makowsky MJ, Madill HM, Schindel TJ, Tsuyuki RT. Physician perspectives on collaborative working relationships with team-based hospital pharmacists in the inpatient medicine setting. *The International journal of pharmacy practice.* 2013;21(2):123-127.
9. Preslaski CR, Lat I, MacLaren R, Poston J. Pharmacist contributions as members of the multidisciplinary ICU team. *Chest.* 2013;144(5):1687-1695.
10. Scott MA, Hitch B, Ray L, Colvin G. Integration of pharmacists into a patient-centered medical home. *Journal of the American Pharmacists Association : JAPhA.* 2011;51(2):161-166.
11. Barlas S. CMS to Test Enhanced Medication Therapy Management Model: Aims for Greater Use of Pharmacists, Cost Savings, and Better Outcomes. *P T.* 2016;41(7):423-441.
12. Geurts MM, Talsma J, Brouwers JR, de Gier JJ. Medication review and reconciliation with cooperation between pharmacist and general practitioner and the benefit for the patient: a systematic review. *Br J Clin Pharmacol.* 2012;74(1):16-33.
13. Cohen LB, Taveira TH, Khatana SA, Dooley AG, Pirraglia PA, Wu WC. Pharmacist-led shared medical appointments for multiple cardiovascular risk reduction in patients with type 2 diabetes. *Diabetes Educ.* 2011;37(6):801-812.
14. Viswanathan M, Kahwati LC, Golin CE, et al. Medication therapy management interventions in outpatient settings: a systematic review and meta-analysis. *JAMA internal medicine.* 2015;175(1):76-87.
15. Nuffer W, Harmon C, Dye L, Nishiyama M. A novel advanced pharmacy practice experience training model focused on medication therapy management delivery within provider offices. *Curr Pharm Teach Learn.* 2018;10(9):1288-1294.
16. University of Wisconsin-Madison. Self-Reported Medication Nonadherence Measurement. 2019; https://www.surgery.wisc.edu/research/researcherslabs/corrine-voils-phd/self-reported-medication-nonadherence-measurement/. Accessed 8/29/2019.
17. Haag JD, Davis AZ, Hoel RW, et al. Impact of Pharmacist-Provided Medication Therapy Management on Healthcare Quality and Utilization in Recently Discharged Elderly Patients. *Am Health Drug Benefits.* 2016;9(5):259-268.
18. Brummel A, Lustig A, Westrich K, et al. Best Practices: Improving Patient Outcomes and Costs in an ACO Through Comprehensive Medication Therapy Management. *Journal of managed care & specialty pharmacy.* 2014;20(12):1152-1158.
19. McCollum M, Nuffer W, Ellis SL, Turner CJ. Physician acceptance of pharmacotherapy recommendations made by pharmacy students in a rural pharmacy-based diabetes care and education clinic. *Am J Pharm Educ.* 2009;73(2):24.
20. Barlas S. Medicare Names Six Plans for Part D MTM Demo Starting in January. *P T.* 2016;41(12):738.

DOI: https://doi.org/10.24926/iip.v10i4.2129

Table 1: Specifics of patients receiving medication therapy management consultations (n=180)

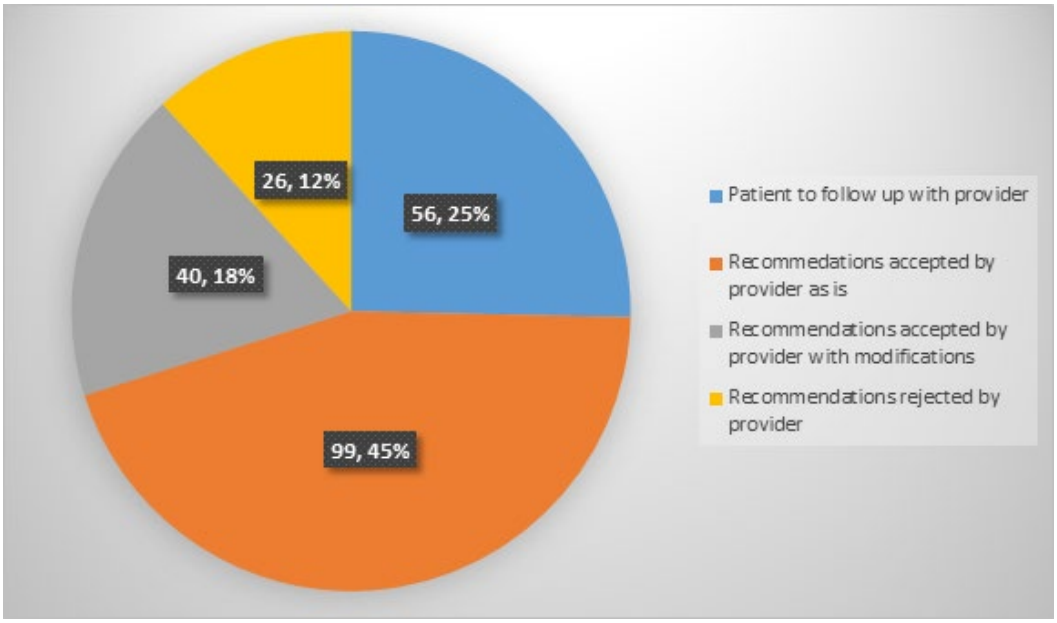
Parameter	n (%)	Baseline value (mean)	Exit value	P value
Diagnosis of hypertension	**107 (59%)**			
Hypertensive patients identified as non-adherent to one or more medications	92 (86%)			
Hypertensive patients demonstrating lower blood pressure readings from baseline after MTM services	22 (21%)	139/82	133/79	p=0.013(systolic) p= 0.202 (diastolic)
Hypertensive patients maintaining consistent blood pressure under 140/90 for at least 9 months	24 (22%)			
Diagnosis of diabetes	**127 (71%)**			
Patients with diabetes identified as non-adherent to one or more medications	101 (80%)			
Patients with diabetes demonstrating lower A1C values from baseline after MTM services	27 (21%)	7.65%	7.33%	p=0.112
Patients with diabetes maintaining consistent A1C values below 9%	51 (40%)			
Reduction in weight from baseline	**71 (39%)**			

DOI: https://doi.org/10.24926/iip.v10i4.2129

Table 2. Changes on patients' health-related quality of life questions after receiving services

Quality of life question						**Response rate**	**n (%) improved from baseline**
Q1)Would you say that in general your health is: excellent/very good/good/fair/poor						82 responded	31 (38%)
Q1 responses before services n (%)	Excellent: 5 (6%)	Very good: 20 (24%)	Good: 40 (49%)	Fair: 15 (18%)	Poor: 2 (3%)		
Q1 responses after services n (%)	Excellent: 5 (6%)	Very good: 20 (24%)	Good: 40 (49%)	Fair: 15 (18%)	Poor: 2 (3%)		
Q2) Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?						80 responded	29 (36%)
Q3) Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?						83 responded	24 (29%)
Q4) During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?						82 responded	16 (20%)
Q5) Think about your current medical conditions. How confident are you that you can manage these medical conditions day-to-day: very confident/somewhat confident/not very confident						62 responded	14 (17%)
Q5 responses n (%)	Very confident: 53 (65%)	Somewhat confident: 25 (30%)	Not very confident: 4 (5%)				
Q6) I have increased my knowledge on how to manage my health: Strongly agree, agree, neither agree or disagree, disagree, strongly disagree							
Q6 responses n (%)	Strongly agree: 43 (53%)	Agree: 32 (39%)	Neither agree or disagree: 6 (7%)	Disagree: 0 (0%)	Strongly disagree: 1 (1%)		
PHQ4 scale (anxiety/depression)	73 patients responded at baseline and after receiving services		17 patients demonstrated improvements in scale score (23%)				

Figure 1. Provider Acceptance to Pharmacy MTM Recommendations (number of recommendations, % of all recommendations)



DOI: https://doi.org/10.24926/iip.v10i4.2129