



Contents lists available at ScienceDirect

Exploratory Research in Clinical and Social Pharmacy

journal homepage: www.elsevier.com/locate/rcsop

An exploration of barriers, facilitators, and practical solutions for adopting medication synchronization into community pharmacies: A qualitative analysis



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ARTICLE INFO

Article history:

Received 4 March 2021

Received in revised form 12 January 2022

Accepted 29 January 2022

Available online xxx

Keywords:

Service development and implementation

Community pharmacy

Medication adherence

Medication synchronization

Pharmacist services

ABSTRACT

Background: Community pharmacies across the nation have adopted medication synchronization (Med Sync) services with the aim of improving medication adherence. To help incorporate Med Sync into a pharmacy's workflow, pharmacy associations and organizations developed implementation guides for community pharmacies. However, considerable variability in the adoption of this service exists as pharmacies struggle to implement Med Sync into traditional workflow. Researchers identified early adopters of Med Sync who dispense majority of their prescriptions as part of a Med Sync program. An exploratory study was undertaken with the aim to reveal themes surrounding facilitators and barriers to adoption of Med Sync in community pharmacies.

Objectives: The objective of this study was to explore the barriers and facilitators associated with Med Sync adoption in community pharmacies and generate practical solutions for service adoption. Methods Community pharmacies participating in the North Carolina's Community Pharmacy Enhanced Services Network (CPESNSM) who were early adopters of Med Sync and had greater than 50% of their prescription volume being dispensed as part of a Med Sync program were recruited to participate in semi-structured interviews. Interviews were conducted, recorded, and transcribed verbatim with representatives who led the adoption of Med Sync in their pharmacy. Inductive coding and summary analysis were used to analyze the interview data and determine themes associated with facilitators and barriers.

Results: Analysis of the interviews revealed four key themes: program organization, staff engagement, patient engagement, and provider engagements for Med Sync adoption. Each of these themes had several sub-themes, contributing to facilitators and barriers to Med Sync adoption. Subthemes of program organization included having organizational infrastructure, including a pharmacy software system, a dedicated area, and a consistent enrollment process. Subthemes of staff engagement included having a team-based approach, job training, and staff incentives. Patient engagement's subthemes included communication, finances, health literacy, and transportation. Provider engagement resulted with subthemes including lack of communication and provider-pharmacist relationships.

Conclusion: To ensure successful adoption of Med Sync into traditional workflow, community pharmacies should employ a multi-factorial approach that includes internal and external components to the community pharmacy. This study identified facilitators associated with successful Med Sync adoption such as adequate staff engagement and requisite program organization. Barriers hindering successful Med Sync adoption resulted from challenges with provider and patient engagement. This study also makes an important contribution by providing practical solutions to Med Sync adoption based on participant responses and identified themes and sub-themes.

1. Introduction

Ninety percent of the nation's annual healthcare spending is a result of the management of patients with chronic conditions.¹ Yet, it is estimated

that 50% of patients report nonadherence to their prescription medications each year.^{2,3} Medication nonadherence is responsible for approximately \$100 to \$300 billion of annual U.S. healthcare costs.⁴⁻⁶ To reduce healthcare expenditures and improve medication adherence, some

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community pharmacies offer patient care services like medication synchronization (Med Sync).

More than 20,000 community pharmacies across the nation have adopted Med Sync with the aim of improving medication adherence.⁷ Patients with chronic conditions typically manage multiple prescription medications filled on various days of the month. It can be challenging for patients to be adherent due to the burden of managing multiple medications and pharmacy visits monthly. Med Sync is a service that proactively aligns prescription refills for pharmacy pick-up or delivery on a single day each month.^{8,9} It eliminates the need for patients to call in multiple prescription refills and reduces their trips to the pharmacy.⁹ Studies show that patients enrolled in a Med Sync program have higher rates of adherence compared to those not enrolled.^{8,10–12}

To help incorporate Med Sync into workflow, pharmacy associations and organizations developed implementation guides for community pharmacies.^{9,13–15} The American Pharmacists Association (APhA) Med Sync *Implementation Guide for Pharmacy Practices (IGPP)* outlines Med Sync implementation in 10 steps and details processes of patient recruitment, synchronization of medications, and daily tasks and procedures.¹⁴ However, research on Med Sync adoption has focused solely on patient outcomes and has not reported facilitators and strategies used by successful implementers to overcome barriers. In fact, one study concluded that though Med Sync works to overcome barriers of medication adherence, there are barriers to its implementation.¹⁶ Furthermore, identifying and understanding facilitators accelerates the implementation of practice.¹⁷ Research needs to investigate the implementation of Med Sync, specifically in pharmacies with successful adoption. This study explored the barriers and facilitators in community pharmacies who have successfully adopted Med Sync. Researchers also assembled practical solutions to common challenges associated with Med Sync adoption in community pharmacies based upon the data shared from the participants.

2. Methods

This observational, exploratory study conducted by a research team of two female pharmacists, SF, PharmD, RPh, and TH, PharmD, PhD, RPh; one male pharmacist, PB, PharmD, RPh; a female pharmacy student, SC, PharmDc, and a female qualitative research methodologist, LM, PhD, MEd, used qualitative interviews to gain an in-depth understanding of the participants' knowledge regarding the phenomena¹⁸ of Med Sync implementation in community pharmacies. The research team's experience with qualitative research methods spanned from one to twenty years, with one pharmacist and the qualitative research methodologist both having experience greater than ten years. The other pharmacist and the pharmacy student who facilitated the interviews received extensive training through a nationally recognized qualitative institute. The interview guide was externally vetted by the Odum Institute for Research in Social Science at the University of North Carolina and piloted among pharmacists.

The idea to use interviews to explore Med Sync barriers and facilitators was based on the Diffusion of Innovation Theory, a widely used systemic framework to describe the process of adoption or rejection of new ideas.¹⁹ The theory has two main components, the level of the adopters of the innovation and the clusters of influence. First, the adopters of the innovation places individuals into one of five categories: innovators, early adopters, early majority, later majority, and laggards. Innovators, as their names suggests, are the first individuals to test a new product or process.¹⁹ Early adopters usually follow the innovators; although they are not involved in the innovation process; they are the first to accept the innovation.¹⁹ Early adopters are of interest because they are the first group to fully adopt new ideas; including figuring out how to overcome barriers with new adoption. In fact, diffusions of innovation in healthcare are dependent on the watching of early adopters.²⁰ Overtime, the innovation diffuses from innovators and early adopters to early majorities, late majorities and laggards who collectively look to the early adopters for advice and information about the innovation.²¹ Secondly, there are three clusters of influence on the rate of diffusion of innovations within an organization: the

perceptions of the innovation, the characteristics of the individuals who may adopt the change, and contextual and managerial factors within the organization.²⁰ Using these distinctions, we aimed to recruit participants from community pharmacies who would be considered early adopters, as they are accepting an innovation (Med Sync) and using appropriate resources to adopt the innovation. In addition, this study explored the three clusters of influence as the participants implemented an innovation (Med Sync).

Purposeful sampling was used to identify participants. Inclusion criteria included working at a community pharmacy participating in the State's Community Pharmacy Enhanced Services Network (CPESNSM) with greater than 50% of prescription volume being dispensed as part of a Med Sync program. Pharmacies having greater than 50% of prescriptions volume in a Med Sync program were believed to have successfully adopted the program into traditional workflow and were of interest to interview. The CPESNSM is a nationally integrated network of community pharmacies that have agreed to offer medication management services.²² The researchers have previously worked with the State's CPESNSM pharmacies on studies describing Med Sync and pharmacy performance.²³ Previous studies, however, were unable to determine detailed and thorough facilitators that play a role in supporting Med Sync and concluded the need to study adoption barriers to Med Sync delivery.

Twenty-three pharmacies were sampled based on self-reporting data on the proportion of their prescription volume that is aligned with medication synchronization. Twelve community pharmacies met inclusion criteria and individuals identified as the Med Sync program leader were invited via email to participate in a semi-structured interview. After two emails with no response, the researchers did not pursue the participants further. Interviews were conducted in October 2019 by three members of the research team (TH, SC, SF) via Zoom Client for Meetings [computer program] Version 4.6.7. Researchers conducted the interviews in their workplace. Informed consent was collected verbally during the interview. Each interview was approximately 60 min and was audio recorded and transcribed verbatim (SC). Transcripts were not returned to interviewees for comment, correction, or feedback on the findings.

The semi-structured interview protocol was guided by the diffusion of innovation and the three clusters of influence on the rate of diffusion of innovations within healthcare organizations. The three clusters include identifying the perceptions of the innovation, the characteristics of the individuals who adopt the change, and contextual and managerial factors within each organization.^{19,20} Greater detail was given to exploring the contextual and managerial factors within each organization as each pharmacy recruited perceives Med Sync as a beneficial service, noted by their early adopter status. Additionally, questions focused on specific areas from APhA's Implementation Guide, including program resources, patient recruitment, patient enrollment, medication synchronization, and patient contact.¹⁴ The interviews probed participants to share experiences with primary care or specialist providers, staff, and patients as these are regularly referenced in the literature concerning service adoption in community pharmacies.²⁴ (Appendix 1). The interview questions were written by one researcher, and then discussed with another two researchers to ensure the clarity and relevance of the questions.

An inductive or open coding approach was used, and codes were derived from the data in order to reflect the participants' perspectives.^{25,26} Initial coding was an iterative process conducted by the entire research team. As a group (TH, LM, SC, SF), the team read and openly discussed participant responses and through these discussions created codes and corresponding definitions. Memos were written during and after each coding session to capture the analytic process and any themes or patterns that were emerging in the data.^{25,26} After the initial coding of the data, individual summary matrices based upon interview questions were created, and data were reviewed iteratively to identify key ideas expressed by participants regarding the facilitators and barriers in their Med Sync program. Cluster analysis was used to focus on the data that generated novel insights and practical solutions for successful Med Sync adoption.^{25,26} All analysis was completed at the researchers' workplace.

Clustering is the process of grouping similar codes and labeling them as themes and any corresponding sub-themes.^{25,26} Three members of the research team (TH, LM, SC) conducted the cluster analysis and identified themes. A fourth researcher (SF), a pharmacist, verified the themes. Themes were further validated by a fifth researcher (PB), who also served as director of pharmacy services for the state's CPESN. Microsoft Word and Excel were used to organize and analyze the data. Reporting of this study is in line with the Consolidated criteria for reporting qualitative research (COREQ).²⁷ (Appendix 2). This study (IRB# 19-1832) was determined to be exempt.

3. Results

Seven of the 12 pharmacies responded to our invitation to participate, resulting in six pharmacists and one pharmacy technician interviewed. All participants were independent pharmacies. Table 1 displays the demographics of participating pharmacies. Analysis of the interviews centered around four themes—program organization, staff engagement, patient engagement, and provider engagement. (Fig. 1). Each of these themes had several sub-themes, contributing to facilitators and/or barrier to Med Sync adoption.

3.1. Program organization

Program organization was an overarching theme for Med Sync adoption. Subthemes of program organization included having organizational infrastructure, including a pharmacy software system, a dedicated area, and a consistent enrollment process.

A pharmacy software system was used for Med Sync program organization, with the majority of participants using PioneerRx Software. One participant stated, “Pioneer is a really good system to work with and they have a good sync process within the Pioneer system.” Another participant recounted how “overwhelming” the Med Sync process was without the support of a pharmacy software system. They expressed how the system helped them to implement Med Sync,

“In the beginning, we had a big notebook, where we had the drugs, and we had the due dates and we had them sorted by the date they were due... that felt overwhelming in the beginning... I think Pioneer [pharmacy software system] has come a long way within their Med Sync program... It's grown a lot as far as the capabilities.”

A dedicated area for Med Sync allowed the participants to focus on fulfilling Med Sync duties. One pharmacy devoted a small office area for the process, “It's [dedicated area] a little bit secluded, so she [staff member] can actually kind of stand and work on her things [Med Sync duties].” These dedicated areas were mostly made up of a computer, calendar, and phone.

Participants reported having a consistent enrollment process and criteria for patient identification. One participant shared, “I would say outliers [pharmacy performance adherence scores] are the biggest way we're identifying patients at this point.” Most pharmacies had an enrollment process whose steps included varying levels of patient marketing and intake, transfer of medications from other pharmacies, communication with providers, medication reconciliation, communication with patients, and enrollment (i.e., selection of sync date). One participant shared their process below,

“[The patient] would fill out the new patient intake form... We collect their insurance information and provider information... We would contact a pharmacy to get transfers [if needed], but we also call the primary care provider to request an active medication list so that when we do get the transfer in, we can cross-check the prescriptions that we received to make sure that they are up-to-date and match with the providers' medication list. Once we reconcile the medications, we would then contact the patient to let them know what we found... Once we clarify and resolve any medication discrepancy, then we would go about enrolling the patient in Med Sync and selecting which day would be best for the patient to have the medications filled.”

Patients were notified informally through verbal communication or formally through writing upon program enrollment. Enrollment dates were selected for several reasons with patient preference and pharmacy convenience being the top factors in selecting a sync date. One participant shared, “It [sync date] depends on what's convenient for them [patient]... You tell us when you want it... What day or what week and we kind of go from there.” Another participant using pharmacy convenience for sync date selection shared, “The patient's sync date is always going to be on Sunday.” Table 2 further details the characteristics of the dedicated enrollment process used by the early adopters of Med Sync who participated in this study.

3.2. Staff engagement

Staff engagement was another theme identified for adoption of Med Sync. Tasks were extended to all members of the pharmacy including pharmacists, technicians, cashiers, student interns, and delivery drivers. Subthemes of staff engagement included having a team-based approach, job training, and staff incentives.

Many participants described a team-based approach to Med Sync adoption. A team-based approach focused on every staff member playing a role in the Med Sync process as opposed to a single individual being responsible for the program. One participant shared,

“All of our staff members help on a daily basis... our pharmacists are checking the prescriptions, our technicians are filling the baskets and printing the labels, our cashiers are doing the phone calls... I think everybody... and even our delivery driver, he even has a little communication piece and delivery piece of it. Literally, it is now delegated to all of our staff.”

Furthermore, one participant recounted the “vulnerability” of their program when it was only worked on by a single staff member. They shared, “We had one technician that was doing [Med Sync] and it got to where I felt like the whole program was very vulnerable because only one person knew how to do it.” Within a team-based approach, participants described that staff had defined roles and responsibilities. One participant mentioned, “We have a dedicated team for the Sync program.”

In addition to having defined roles and responsibilities, participants shared they implemented formal or informal staff training. “[Training] helps us a lot too... especially with staffing,” one participant shared. For instance, five participants discussed using job shadowing as a tool to train new staff members. Three participants revealed they used a formal, detailed step-by-step guide on how to perform Med Sync responsibilities. One participant stated, “We have a training checklist that we use when we bring on a new technician... and we use that checklist to make sure they understand all the key workflow elements.” The other two participants described informal, on-the-

Table 1
Participating community pharmacy characteristics.

Characteristics	Pharmacy 1	Pharmacy 2	Pharmacy 3	Pharmacy 4	Pharmacy 5	Pharmacy 6	Pharmacy 7
Geographic region	Rural	Urban	Urban	Rural	Rural	Urban	Urban
Average Prescription volume per week	1750	900	650	4500	750	2000	250
Years of Reported Med Sync Services	4–5	7	3	3–5	5	4	2

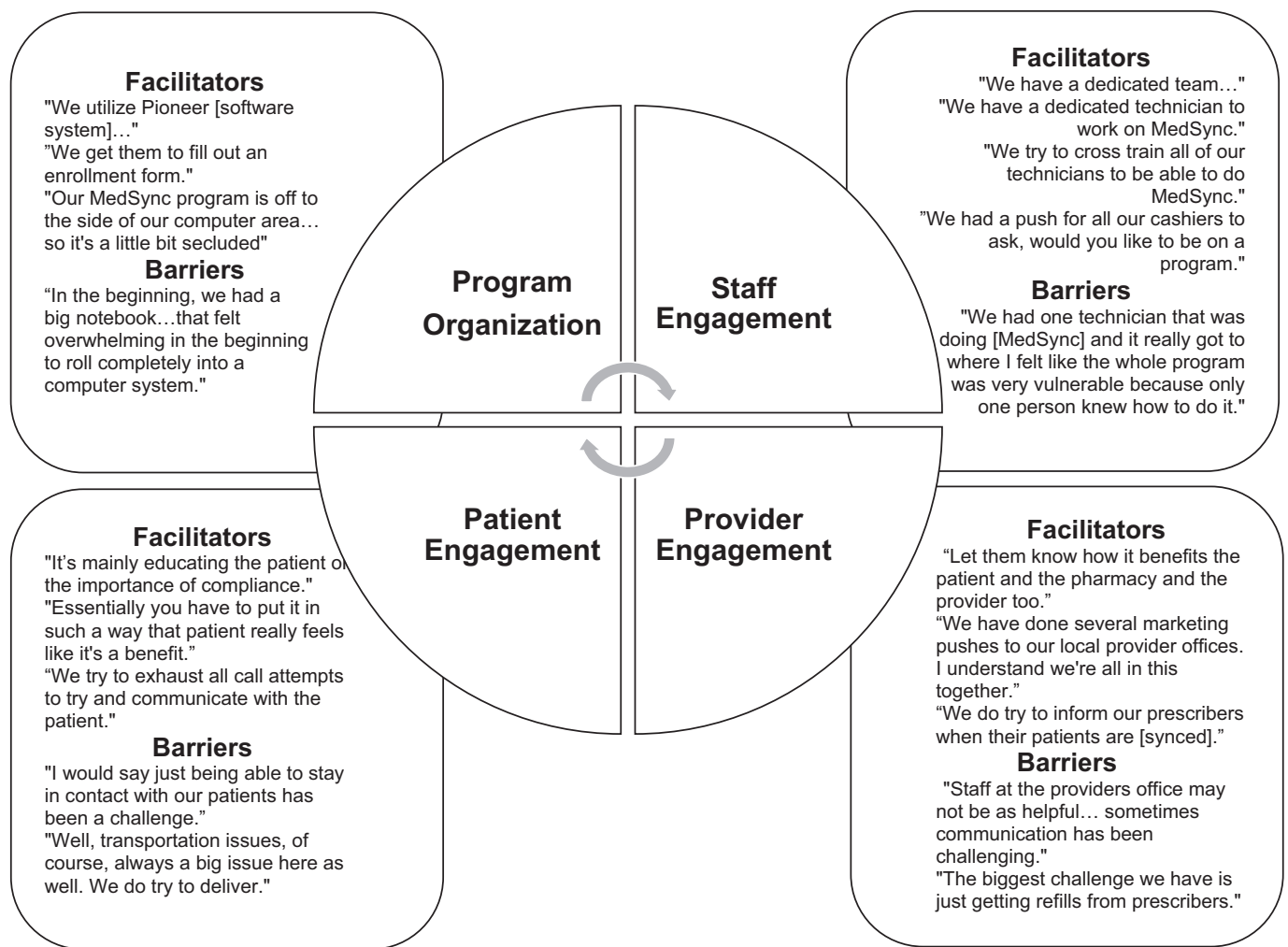


Fig. 1. A conceptual model of themes and barriers and facilitators to Med Sync adoption obtained from interview quotes.

job training to introduce new staff members to the Med Sync program. Overall, participants believed staff training was helpful in the success of their program. Other approaches to keep staff engaged included providing adequate staff coverage, work huddles, and friendly competitions. One participant shared, "We do weekly huddles in the beginning of the week because we can forecast the week." When asked to describe how staff members were provided time to work on Med Sync, six participants struggled to answer this question, stating that the process had become part of their routine. For instance, one participant stated,

"In my mind, it doesn't take a lot of extra time... To me it actually saves time... Now when you first start a patient it will take some extra time, but you know after that first month. I mean, it's really more efficient in my mind to have them on Med Sync for the patient and for us."

Participants were probed to also think about the earlier stages of Med Sync implementation. One participant responded by describing a slow, gradual implementation of the program until it became a priority: "In the beginning, we allocated a couple of hours each day for the technician that started in it. But now it is probably 60% of one of our technician's full-time role." Another participant responded, "I think the key is just start... start with five patients and then slowly build it from there." Additionally, all participants believed having dedicated staff with job training, making Med Sync a priority, and operating the program using a team-based approach helped with providing staff time for Med Sync.

Participants mentioned regularly scheduled meetings, positive praise, and proactive check-ins as a mechanism to keep staff engaged. When asked whether staff members were provided incentives, two participants described Med Sync as an integral part of their daily routine and did not utilize incentives to keep staff engaged. One participant shared,

"Engagement overall is really not much of an option [you] come to work and do your job... But as far as engagement...we have to do little reminder pushes ... Sometimes we'll throw up a challenge within [the] team meeting."

3.3. Patient engagement

Patient engagement was a theme identified at the patient level for Med Sync adoption. Its subthemes included communication, finances, health literacy, and transportation. Participants also shared multiple attempts and practical solutions to accommodate patient barriers.

Four participants discussed their communication/contact challenges with patients. One participant shared, "I would say just being able to stay in contact with our patients has been a challenge... We try to exhaust all call attempts to try and communicate with the patient, but it would just be great if you know we didn't have to do that for a lot of our patients." Another participant shared, "Just getting in touch with the patient. That would be more our challenge." When asked "What do you do if a patient cannot be reached?", participants shared that they would attempt to find and update patient contact information by looking through external sources (i.e., obituaries, emergency contacts, jail notices, etc.) and by contacting the patient's provider.

Table 2
Key characteristics of Med Sync enrollment process.

Best practices	Tasks	Participant quote
Program marketing	<ul style="list-style-type: none"> Targeted phone calls In-person encouragement Newspaper ads Contacting provider offices Community presentations Promotional material (posters, bag attachments, stuffers) 	<p><i>When patients saw 'not enrolled' on their receipt, they had FOMO [fear of missing out]. Fear of missing out.... [we explain] it's about our Med Sync program where you pick your meds up all at one time. 'Oh, that sounds great. Why don't we do that.'</i></p>
Patient identification/-intake	<ul style="list-style-type: none"> Identify patients using Part D MTM platforms such as In-take Form Verbal intake at drop off or pick up Automatic enrollment of patients receiving chronic therapy 	<p><i>"To get them [the patient] enrolled, we get them to fill out an enrollment form that has the patient's name, date of birth, basic demographics, but also the best contact number for them."</i></p>
Transfer meds from other pharmacies	<ul style="list-style-type: none"> Contact additional pharmacies for needed prescriptions 	<p><i>"We get all transfers, if necessary"</i></p>
Contact Primary Care Provider (PCP)	<ul style="list-style-type: none"> Confirm active med lists from all providers Inform PCP of patient's Med Sync enrollment Request new/up to date prescriptions 	<p><i>"We get medication lists from all their different physicians, PCPs, specialists, etc"</i></p>
Reconciliation / Confirm active med list (match with transfer list)	<ul style="list-style-type: none"> Reconcile med list with providers Reconcile med list with other pharmacies 	<p><i>"We try to reconcile all those things. So full med rec is completed beforehand"</i></p>
Contact the patient to resolve any additional discrepancies		<p><i>"Once we reconcile the medications, we would then contact the patient to let them know this is what we found, these are the discrepancies and then once we clarify, we resolve any medication discrepancy"</i></p>
Enrollment (selecting a date)	<ul style="list-style-type: none"> Select date based on patient preference (finances, schedule, transportation) Select date that is convenient to pharmacy 	<p><i>"[technician] tally up how many pills of each med we need to give to the customer, and they'll set a sync date and get them all lined up until and short fill whatever needs to be short fill to get them, you know, lined up"</i></p>

One participant stated, *"We call the doctor's office to see if they [patients] have a different phone number"*.

Participants also discussed financial constraints as a barrier to patient engagement. One participant shared, *"[Patients] try to stretch a 30 day supply to 45 days or 60 days because they just can't afford it monthly, and some patients won't do MedSync because of that."* Another participant shared, *"For some, affordability with other medicine in one month was a little tricky until they kind of got on their routine. Before it was kind of spaced out and they didn't have to [pay for all medicines] in one fell swoop."* When probed *"What do you do if a patient does not pick up all their meds due to cost,"* All, but one participant, shared practical solutions to overcoming patient financial barriers. One participant shared, *"If it's a medication they need for chronic conditions, we still fill it for them. If they're eligible, we try to find a coupon for them to apply to reduce their copay, but we never refuse a medication to be filled, just because of the cost."* Two participants discussed consulting with the patient's doctor's office to find cheaper alternatives. Other solutions included implementing a flexible sync date, delayed payment, medication assistant programs, and selection of alternative medications. The lone participant to not share a practical solution stated, *"We're in a good area where we don't have to deal with too much of that."*

Three participants shared their challenge with patients' health literacy and adherence. *"Probably the biggest challenge with the sync program is trying to keep people adherent,"* one participant shared. The only practical solution to this barrier, however, was to educate patients on the importance of their medication.

Lastly, transportation was identified by two participants as a barrier to patient engagement. One participant shared, *"Transportation is always a big issue here."* The same participant then explained, *"We do try to deliver. We go lots of places that we probably shouldn't, but we try to help patients as much as we can,"* revealing that delivery is a practical solution to overcoming the barriers with transportation. Another participant also described delivery as a tool for overcoming barriers to transportation, they also noted transportation as a way to potentially support patient engagement and adherence. They shared, *"We don't like to deliver meds without discussing with the patients, but it's sometimes hard when we can't get ahold of them and we know they have meds that they can't miss. That's dangerous to their health. If we haven't been able to get in touch with them by their sync dates, we'll send one week of medications with a letter that says we need to hear from you. Please give us a call so we can review your medication before we send out the rest."*

Additional patient barriers and participants' practical solutions are reported in Table 3.

3.4. Primary care or specialist provider engagement

Lastly, provider engagement resulting as a theme in Med Sync adoption with subthemes including lack of communication and provider-pharmacist relationships. Participants discussed how continuous communication with providers (primary care providers or specialist providers) throughout the entire Med Sync process was a way to overcome these barriers. This included ensuring that providers were knowledgeable about Med Sync. One participant shared,

"We have done several marketing pushes to our local provider offices. I understand we're all in this together. Here's what we're doing to help your patients. So, you [provider] can be aware that we have a med synchronization program. So overall, we just did a huge education push."

Table 3
Patient barriers to Med Sync adoption.

Barriers	Participant quotes – practical solutions
Communication	<p><i>"Our staff goes above and beyond. They would look at jail websites to see if the patient was in jail. They would also look at the obituaries. Just, trying to investigate more, and we've also asked for their emergency contacts, so we can call that person to get us in contact with the patient. We try to exhaust all call attempts to try and communicate with the patient."</i></p> <p><i>"The delivery guy knows everyone in the area. He'll just go by the house sometimes and stops to see if they're there and what's going on."</i></p> <p><i>"We would even call the doctor's office to see if they have a different phone number for the patient."</i></p> <p><i>"If we don't get an answer, we call the physician to see if they have a different phone number. A lot of times, we'll call the neighbors."</i></p>
Financial	<p><i>"If it's a medication that you know they need for chronic conditions, we still give it to them..."</i></p> <p><i>"We will still fill it and we would just add the charges to the AR (account receivable) account and when they have the means to pay them, they would call us or come in to pay."</i></p> <p><i>"There's a program where medications are a lot cheaper than just regular price. A lot of times we'll try to get them in touch with [program assistance]."</i></p> <p><i>"We have a lady that has decided that instead of contributing other places, she gives us an open account and leaves it up to us on who they use that money for. So, she contributes about \$150 a month. She calls it her Angel account. We've had one to two people use it."</i></p> <p><i>"We just try to work with the patient's doctor to get the prescriptions changed to reduce cost."</i></p> <p><i>"We consult with the provider, to see if there is anything else that they can prescribe that may be cheaper for the patient."</i></p>
Health Literacy	<p><i>If [patients] don't want to fill because of the cost... All we can do is just counsel the patient and let them know the importance of taking the medication."</i></p>
Transportation	<p><i>"We do try to deliver. We go lots of places that we probably shouldn't, but we try to help patients as much as we can."</i></p>

Participants communicated with providers via phone call or in-person to educate them about Med Sync and highlight the benefits of the program. Some participants added that in-person visits were used to maintain relationships with providers. One participant shared, *“I go around and visit them [providers] fairly often, so we have a pretty good relationship.”*

Participants informed providers of their patients' enrollment in the Med Sync program. Three participants notified providers via phone call, while one participant communicated via fax. The remaining three participants did not alert the provider about a patient's enrollment; however, two participants stated they alerted the provider when there was an issue. For instance, one participant stated,

“It's not anything proactive... It's more if we had something come up where we're not getting refills back or something's been changed or stopped, and we weren't notified. We reach out at that point.”

Despite proactive communication with providers, barriers were still present, particularly how long it took to get refill requests completed. One participant stated, *“I'd say the biggest challenge we have is just getting refills from prescribers [providers].”* Participants revealed various ways to deal with this barrier, including enacting short fills, 90-day refill requests, and prescription overrides when possible. Participants attempted to solve this barrier with a follow-up phone call. If the provider did not respond, the patient was asked to contact their provider. One participant shared, *“We always have the patient call because we know that the provider office tends to respond faster.”*

4. Discussion

Although Med Sync is proven to benefit both patients and pharmacies, many pharmacies continue to have difficulty adopting Med Sync into workflow.^{28–30} Issues surrounding the adoption of new services is a known dilemma in healthcare service innovations.³¹ In order for new services to be successfully adopted and diffused into healthcare, favorable conditions must be in place. Research has tried to incorporate the influence of active efforts in the probability of innovation adoption and diffusion.³² Diffusion of innovation can be facilitated by the means of marketing, communication, opinion leaders and change agents, public administration and governance systems, and re-invention processes.³² The current study synthesizes the favorable conditions that allowed early adopter pharmacies to implement Med Sync as well as the barriers they had to overcome. Of note, internal factors to the participant pharmacies' operations included program organization and staff engagement, while external factors to the pharmacies' operations included patient engagement and provider engagement, with the results demonstrating that successful adoption requires program organization, in addition to staff, patient and provider engagement. This study shows the adoption of Med Sync requires multifactorial approaches that are internal and external to the community pharmacy.^{7,14,33,34}

Participants identified a range of facilitators needed and barriers to be addressed for Med Sync programs to succeed. Participants also shared practical solutions that were implemented to overcome identified barriers. Based on the findings from study themes, the research team outlined practical solutions for community pharmacies to facilitate the successful adoption of Med Sync in Table 4.

4.1. Program organization

APhA's Med Sync IGPP alludes to aspects of program organization necessary for the adoption of Med Sync, including a dedicated area, enrollment and documentation forms, and a consistent filing system.¹⁴ However, the guide does not provide strategies on how to generate these physical resources. Facilitators inherent to the participant pharmacies' program organization were related to infrastructure, software, and enrollment. This

Table 4
Practical solutions to Med Sync adoption.

Theme	Practical solutions/recommendations
Program organization	Create a dedicated work area <ul style="list-style-type: none"> - Pharmacies should have a dedicated (preferably isolated) work area set aside for Med Sync operations. The work area should include items necessary for Med Sync operations (computer, calendar, and phone)
	Use a pharmacy software system <ul style="list-style-type: none"> - Pharmacies should select a pharmacy management system that contains Med Sync features to assist seamlessly with Med Sync operations
	Define Med Sync Enrollment Process <ul style="list-style-type: none"> - Pharmacies should have a defined and consistent enrollment process
	Employ a Team-Based Approach <ul style="list-style-type: none"> - Pharmacies should use whole-team involvement for Med Sync operations. - Each staff member should have defined roles and responsibilities.
Staff engagement	Train and Educate Staff <ul style="list-style-type: none"> - Pharmacies should educate all staff members on Med Sync Operations. - Pharmacy staff members directly involved in med sync should receive training to carry out staff duties.
	Incentivize Staff <ul style="list-style-type: none"> - Incentives and rewards should be used early on in the adoption of Med Sync services. - After successful adoption of Med Sync, pharmacies should continue to use incentives/rewards to keep staff members engaged.
	Establish and Maintain Communication <ul style="list-style-type: none"> - Use external sources of contact when necessary (obituaries, jail sites, emergency contacts, neighbors, delivery drivers) - Use the patients' providers as an intermediary when necessary
	Accommodate Financial Burdens (when applicable) <ul style="list-style-type: none"> - Delay Payment - Use medication assistant programs/Prescription discount codes/Angel Funds - Recommend alternative/therapeutic equivalent medications
Patient engagement	Assist with Health Literacy <ul style="list-style-type: none"> - Educate patients on their medications
	Accommodate Transportation (when applicable) <ul style="list-style-type: none"> - Consider adding a delivery driver to the team - Facilitate medication pick-ups that align with the patients' transportation schedule
	Establish Communication <ul style="list-style-type: none"> - Ensure that providers are knowledgeable about the pharmacy's Med Sync program - Establish communication preference (phone, fax, etc.) - Use the provider's patients as an intermediary when necessary
	Establish and Maintain Interprofessional Relationships <ul style="list-style-type: none"> - Educate providers on pharmacists' role in patient care - Schedule in-person visits with clinics to keep the providers engaged
Provider engagement	Establish Communication <ul style="list-style-type: none"> - Ensure that providers are knowledgeable about the pharmacy's Med Sync program - Establish communication preference (phone, fax, etc.) - Use the provider's patients as an intermediary when necessary

study confirms that these resources provide a strong foundation to build a Med Sync program and further identifies how to implement the recommendations that lead to program success.

Adequate infrastructure facilitates the success of implementing clinical services into pharmacy workflow.³⁵ Infrastructure is defined as the provision of structural conditions including physical and human resources, but most notably, adequate and comfortable physical space, computer equipment, and clinical devices are needed.³⁵ Since lack of resources is a barrier to clinical service implementation, it is important to understand that infrastructure is necessary for successful adoption.³⁶ Furthermore, a systematic review from Patti and colleagues revealed that a key implementation strategy for adopting Med Sync includes changing infrastructure in a way to adapt to pharmacy needs.³³

One resource to support infrastructure includes the adoption of pharmacy software systems to conduct Med Sync tasks.³³ Unlike APhA's Med Sync IGPP that suggests a non-computerized consistent filing system, participants discussed using their pharmacy software system to help manage Med Sync.³⁷ Goundrey-Smith suggests that pharmacies should use the power of technology to support pharmacy tasks, and therefore, it is

recommended to use pharmacy software systems to manage Med Sync programs.³⁸ While many participants referenced PioneerRx Software as their system of choice, any pharmacy software system with features that assist seamlessly with Med Sync adoption can be used. Furthermore, with the expansion of clinical services in community pharmacies, many software vendors have expanded features available in their software systems.^{38,39}

Studies have shown that in addition to technology, having a dedicated area to provide a service facilitates that service's success.^{35,40} Similar to the APhA's Med Sync IGPP, participants identified the need for a dedicated area for Med Sync. However, our results extend this notion and provide insight into specific resources, such as computers, calendars, and phones, to make a dedicated area conducive to Med Sync operations. All of which are similar to other items needed in dedicated areas of successful clinical services.⁴¹

Successful implementation also involves establishing a clear enrollment process, which is critical for the success of a service.^{8,28,33,34} Participants discussed successful aspects of their enrollment process including patient identification, marketing, and documentation. For instance, participants used explicitly defined criteria to easily identify patients for Med Sync, with some targeting patients with a particular number of chronic medications. Diffusions of innovation also describes strategies such as targeting as useful in customizing communication according to the intended audience's characteristics.¹⁹ This is a tactic consistent with other studies and services for identifying patients who can benefit from Med Sync.³³ Furthermore, participants identified that marketing strategies throughout the enrollment process helped lead to successful adoption of Med Sync. Marketing a program is important because many patients are not aware of the services their community pharmacy offers.⁴²⁻⁴⁴ Such marketing strategies have been successful in similar studies and bridge the divide between the pharmacy and their patients.^{36,41,45,46} Finally, participants shared that documentation was another strategy for successful adoption. Participants stated they provided enrollment forms to patients, notified providers of enrolled patients, in addition to other documentation that assisted their enrollment process.

4.2. Staff engagement

Participants discussed the need for staff engagement for successful adoption of Med Sync, which has been identified as essential for implementing clinical services.^{33,40,42} Also, participants acknowledged the importance of non-pharmacist staff members including pharmacy technicians, cashiers, and delivery drivers. For instance, pharmacy technicians have been identified as key players in supporting Med Sync programs.⁴⁷ This suggests that a team-based approach is an effective strategy for adopting Med Sync. Furthermore, whether or not Med Sync adoption would increase the pharmacists' workload has been in question.³³ This study, however, supports a multi-staff approach to Med Sync that mitigates concerns of additional workload by distributing demand for the service more evenly. In fact, participants believed having whole-team involvement helped them overcome time constraints which are often cited as a challenge when implementing clinical services in community pharmacies.^{47,48}

Having a team-based approach necessitates staff training and education for a clinical service.⁴⁹ Training and educating staff members is a well-documented implementation strategy for community pharmacies offering Med Sync.³³ However, little is known about the breadth of training needed to facilitate Med Sync adoption. Participants identified educating all staff members about Med Sync and training specific staff members for defined roles and responsibilities within the program. Formal and informal approaches were used and are consistent with studies that show successful adoption of clinical services in community pharmacies.⁵⁰ Additionally, training for the provision of clinical services has resulted in greater advantages to providing the service and feelings of confidence to carry out service tasks.^{41,49}

Staff incentives are another strategy shown to increase staff skills and confidence as well as promote the adoption of clinical services.^{36,51}

Participants noted that incentives provided personal and professional recognition that some staff members needed. While staff incentives were mentioned, they were not discussed extensively among participants. This could be because Med Sync is already well established in the pharmacies' workflow, thus, making incentives unnecessary for staff engagement. While incentives can include financial gain or positive praise, it is important to note that incentives in this study were used by participants only as a means to keep staff engaged in the program. Nevertheless, it is important for pharmacies to create mechanisms that keep staff engaged, and incentivizing staff is one mechanism pharmacies can adopt.

4.3. Patient engagement

Studies have demonstrated that patients enrolled in a Med Sync program have higher rates of adherence compared to those not enrolled; however, this requires patient engagement.^{8,10-12} Patient communication is essential for successful adoption of Med Sync, yet there is no information for practical implementation.^{7-11,13-15,33} Participants used creative ways (e.g., searching jail site and obituaries, contacting neighbors and providers) to investigate reasons for patient disengagement in the program. These extra steps can solve unanswered questions and help staff members get in contact with patients. Additionally, dedicating time to checking in with patients can strengthen patient trust and relationships, which can improve patient engagement in Med Sync.

There is a lack of guidance on how to assist patients in Med Sync programs with financial barriers, which are common causes of medication nonadherence.^{3,52} Synchronizing prescriptions to a single day each month creates a large financial burden for some patients. Practical solutions to reduce financial burden may increase the likelihood of patient engagement in Med Sync. Medication assistant programs and prescription discount cards are recommended options to provide prescription drugs at a reduced or no cost. Participants also mentioned setting up account receivables for patients who consistently could not afford their prescriptions. This allows patients to pick up their prescriptions without missing medication doses and create flexibility with paying copay balances. While these solutions mitigate financial barriers, pharmacies may not have access to these programs or services. As a result, staff members can also look for generic alternatives based on insurance plans and out-of-pocket costs or consult with providers to help reduce monthly costs for patients.

Finally, based on participant responses, practical solutions were identified to improve patient engagement in Med Sync by addressing the barriers of health literacy and transportation. For instance, it is important to thoroughly educate patients on their medications. This study suggests that the more patients understand their medications, the more they can be engaged in the program, ultimately improving medication adherence. Additionally, by synchronizing medications to a single day, Med Sync increases convenience for patients with limited or no access to transportation.^{9,10,13,14} This study supports other research that identifies home delivery services as a practical solution for patients who are not engaged in Med Sync due to transportation issues.^{7,8,10,33}

4.4. Primary care or specialist provider engagement

Provider collaboration is identified as a facilitator in the implementation of clinical services when providers are properly engaged.⁴¹ Because provider engagement is considered an external factor and cannot be controlled by the pharmacy, it is important to implement strategies to ensure it remains a facilitator. Participants recommended practical solutions to improve provider engagement in the implementation of Med Sync.

Participants focused on strong provider communication and provider-pharmacist relationships as essential for engaging providers in Med Sync. First, it is crucial to establish the provider-pharmacist relationship in order to develop successful provider communication. Providers will then be more engaged in Med Sync if they have a good relationship based on continuous and consistent communication with the pharmacist.

Participants outlined how they maintained continuous communication and provider engagement. Similar to published literature, participants identified that providers should be educated about the program and its benefits before patient enrollment.^{13,14,33} This proactive approach allows providers to identify patients who are struggling with medication adherence and promotes a team-based approach to patient care. Pharmacy staff can inform providers via in-person visits, phone calls, or fax. However, participants disclosed that in-person visits were more valuable and facilitated quality relationships with the providers. Also, pharmacy staff can provide resources, such as marketing flyers or bubble packs at in-person visits to promote the Med Sync program.

To maintain continuous communication with providers, pharmacy staff should notify providers of patient enrollment in Med Sync and any other interventions identified throughout the program. APhA's Med Sync IGPP recommends providing the patient with an enrollment card to present to the provider,¹³ while Renfro et al. identified a non-specific notification to the provider.⁷ Participants agreed with proactively notifying the provider which was to be done via phone call or fax. As a result, providers were involved throughout the entire process, which helps to prevent future issues. However, pharmacy staff can still run into barriers with provider engagement even with proactive communication. The biggest barrier noted is providers' lack of response from refill requests. Practical solutions include enacting short fills, 90-day refill requests, pharmacy override, or follow-up phone calls from pharmacy or patient.

5. Limitations

Further research is warranted concerning the adoption of Med Sync in community pharmacies as the current findings may not be generalizable to chain pharmacies or pharmacies with a larger volume of prescriptions. Future studies with a larger sample size are also needed to examine other pharmacy characteristics that might be linked to successful Med Sync adoption. At the participant level, there was a single pharmacy technician represented in the sample along with six pharmacists. This distinction between roles in the pharmacy setting could have influenced participants' responses, however, all participants were identified as the leader of the Med Sync program.

It is also important to note that these pharmacies represent early adopters of Med Sync and therefore these findings may not be generalizable to other pharmacies. Early adopters are engaged with innovative services and even when limitations are present, there is an eagerness to adopt services.²¹ Participants shared that Med Sync had been a part of their workflow for several years (1–7 years), making the identification of barriers difficult for several participants to ascertain. Often during the interview, participants were asked to reflect on the early stages of adoption to remember barriers that impacted the initial adoption of the program. Further, all pharmacies were part of the state's CPESN, and may have higher rates of Med Sync adoption compared to other community pharmacies. Finally, this study used qualitative methods, thus a quantitative comparison of the relationship between facilitators associated with successful Med Sync adoption and barriers that hinder them cannot be made. The researchers also want to emphasize that implementation outcomes have yet to be associated with patient outcomes. Research is needed to determine the impact of Med Sync implementation on medication adherence rates of pharmacies self-reporting their utilization of medication synchronization.

6. Conclusion

Although Med Sync benefits patients, pharmacies, and health plans, community pharmacies have difficulty adopting it into their workflow. This study identified facilitators associated with successful Med Sync adoption such as adequate staff engagement and requisite program organization. Barriers hindering successful Med Sync adoption resulted from challenges with provider and patient engagement. This study also makes an important

contribution by providing practical solutions to Med Sync adoption based on participant responses and identified themes.

Research continues to search for strategies that allow community pharmacies to seek opportunities beyond dispensing. Significant research has discussed the need for a fundamental shift in workflow that offers pharmacists the ability to perform more patient care services.^{53–56} While some may view Med Sync as just another clinical service, we believe Med Sync is a tool that promotes a shift in workflow. Not only does Med Sync simplify the traditional, lengthy, and frequent physical acquisition of medications, but it also efficiently layers care coordination, patient evaluation and other medication use support services.⁸ All community pharmacies should consider adopting Med Sync into their practice as a catalyst to further adopt additional pharmaceutical services. It is our hope that the practical solutions provided by this study help accelerate the adoption of Med Sync in community pharmacies.

Declaration of Competing Interest

The authors have no funding support to disclose.

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