

Evaluation of Pharmacy Model in a Trial of Free Essential Medicine Access

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Abstract

Background: In Canada, pharmacists accessing electronic health records (EHR) and mailing medications to patients are relatively uncommon. We evaluated a pharmacy model implemented in a clinical trial that combined allowing the pharmacist access to patients' EHR and mailing medications to participants. **Methods:** We conducted thematic analysis of comments made by participants and prescribers, and chart stimulated recalls with the pharmacist involved with the novel pharmacy model implemented in a clinical trial. **Results:** Major themes from participant's comments related to the ease of obtaining information about medications from the pharmacy and satisfaction with the delivery. Prescribers felt that this model facilitated collaboration with the pharmacist and welcomed suggestions regarding therapeutic medication changes. Major themes from the pharmacist's chart stimulated recalls were that access to participants' EHRs allowed for improved drug therapy management and participant experience, and this pharmacy model increased participant's access to pharmacy services. **Discussion:** According to the pharmacist and prescribers, this pharmacy model facilitated their collaboration in prescribing appropriate medications and participants were generally satisfied with the delivery of medications. **Conclusion:** Participants and prescribers were generally supportive of a pharmacy model that combined allowing the pharmacist access to participants' EHR and medication mailing. This allowed the pharmacist more opportunities for drug therapy management and collaboration with prescribers. It also improved the participant's access to pharmacy services, although those services were not always fully utilized.

Keywords

pharmacy, essential medicines, medicine adherence, primary care, underserved communities

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Introduction

In Canada, pharmacists often receive a prescription and dispense medications to patients in person, because both pharmacists' access to electronic health records (EHRs) and medication mailing are uncommon.^{1,2} A 2016 report by the Canadian Pharmacists Association recommended that pharmacists be allowed access to health records to document patient information and treatment indications.¹ Previous studies have found that pharmacists with access to information in patients' EHRs were able to identify more medication related problems.³ However, due to concerns about confidentiality, some physicians may dislike sharing information in patients' EHR.⁴ Mail-order pharmacies (ie, pharmacies that mail medications to patients) are also relatively uncommon in Canada.² Studies have found that patients' adherence to statins and diabetes medications was higher among those who received their medications by mail.^{5,6} However, some social assistance eligible Americans expressed concerns about delivery times when utilizing mail order pharmacies.⁷

The Advisory Council on the Implementation of National Pharmacare recommended the adoption of a list of essential medications in Canada to ensure access to these medications.⁸ It recommended that such medications be evidence-based and that initially a short list be implemented to ensure more timely access.⁸ Other high income countries such as Sweden have adopted essential medications lists and have found high adherence to this list 15 years later.⁹ Adopting a short list of medications will involve substituting patients' medications with those on the list, when necessary.

This study aims to evaluate a pharmacy model involving pharmacist access to the EHR, medication mailing and advice over the phone that was used in a clinical trial of free

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essential medication distribution. The Carefully seLected and Easily Accessible at No cost Medicines (CLEAN Meds) randomized controlled trial is assessing the effects of providing free and convenient access to a short list of essential medications on adherence to medications.¹⁰ The study sample consisted of 786 participants with half randomized to the intervention group which utilized the pharmacy model in which the pharmacist had EHR access and mailed medications to participants (medications needed immediately were dispensed in-clinic). Twenty-two participants withdrew making the final sample 764 participants.¹⁰ To evaluate this pharmacy model, we conducted qualitative studies of participants, prescribers, and the pharmacist involved in the trial and described medication substitutions and incidents that occurred.

Methods

Participant Comments

A patient experience questionnaire was administered to participants at 9 to 12 months following enrollment in the trial and was conducted either on the phone, in person or via email, as per the participant's preference. The questionnaire consisted of 14 yes-or-no questions with an option to leave a comment for each question, and a section which asked for additional comments. Seven questions related to the pharmacy model and asked participants about their ability to get information about their medications, whether the information given by the pharmacist changed the way they took their medication, delivery times and the condition of medications on delivery. The quantitative results of the study have been reported elsewhere.¹⁰ In this study, we identified comments made by intervention participants to the 7 questions related to the pharmacy model and conducted thematic analysis.

Prescriber Focus Groups

As part of another study, prescribers from the rural and urban sites of the trial were recruited to participate in focus groups, which aimed to learn about their opinions of and experiences with prescribing medications from a short list of essential medications. Two focus groups were held with a total of 15 prescribers in attendance from the urban site in Toronto. One focus group was held with a total of 4 prescribers in attendance from rural sites (Assiginack and Mindemoya). All focus groups were held at St Michael's Hospital in Toronto, Ontario.

Although no question was asked about the pharmacy model, prescribers commented about the model in all three focus groups. We summarized prescribers' comments related to the pharmacy model.

Chart Stimulated Recall

We conducted chart stimulated recalls (CSRs) with the pharmacist utilizing a random sample of intervention participants' charts. CSRs involve interviewing an individual about a participant encounter while viewing that participant's medical chart to prompt the individual's recollection of events.¹¹ We asked the pharmacist questions about his interactions with participants and primary care teams, use of the EHR, opinion of how care provided through this model differed from that of the regular community pharmacy (the study pharmacist has experience working in a community pharmacy) and its overall impact on patient care. We took notes and audio recorded the CSRs for later transcription and analysis. We analyzed the transcripts using inductive content analysis.¹² We read each transcript twice for familiarity and on the third reading, we coded the transcripts. These codes were then categorized into major themes.¹³

Medication Substitutions

Since only a short list of essential medications were provided for free in the trial, medication substitutions were expected. We conducted chart reviews for all participants in the intervention group of the trial to determine the number of times participants' medications were substituted, the substitutions that were made, the reasons for substitutions and the person who initiated each substitution. We included medication substitutions for the first 30 months of the trial, after which the pharmacy software changed, and data were no longer available.

Medication Incidents

We reviewed the medication incidents reported by the pharmacist for 28 months of the trial and categorized each medication incident (which caused no or temporary harm) into the following categories based on their cause: adherence, delivery, dosing, incorrect medications, interactions, miscommunication, missing medications and substitution.

Results

Participant Comments

A total of 310 (of 395, 78.5%) intervention group participants completed the survey. We identified 2 major themes from the comments: ease of obtaining information about medications and satisfaction with the delivery service. Representative quotes are presented in Table 1.

Theme 1: Obtaining Information. Most participants said that it was easy to get information from the pharmacist about

Table 1. Themes, Key Concepts, and Representative Quotes From Participant Comments.

Themes	Key concepts	Representative quotes
Obtaining information	<p>Most participants said it was easy to get information from the pharmacist and it sometimes changed the time of day that participants took their medications.</p> <p>A participant mentioned that information they received from the pharmacy was a little different</p> <p>A participant had unanswered questions.</p>	<p>“I didn’t look for [information about medicines] I got it from the pharmacy”—participant 1 (urban site)</p> <p>“There was useful literature sent along with my medications by the pharmacist”—participant 2 (urban site)</p> <p>“very easy because [pharmacist name] sends a letter”—Participant 3 (urban site)</p> <p>“for my blood pressure medication, I used to take it in the morning and I read that it was better to take it at night so that’s what I do now”—participant 4 (urban site)</p> <p>“I really appreciate this program. My pharmacist has been [a] wonder to talk to and to make sure that I understood what each med was supposed to do for me and to give me good instructions as to how to take them”—participant 5 (rural site)</p> <p>“it’s [the information] a little different but the pharmacy gives me a lot of information.”—Participant 1 (urban site)</p>
Delivery service	<p>Most participants said that their medications arrived quickly and refills usually arrived before their medication was finished.</p> <p>A participant felt that shipping was slow.</p> <p>A participant mentioned that shipping time was affected by weekends.</p> <p>Generally, participants said that medications arrived in good condition as they were packaged well and were kept at the appropriate temp.</p> <p>One participant reported their medication being affected by shipping.</p> <p>They said that when medications arrived late, it was usually a result of the participant forgetting to call to request a refill or due to difficulties in contacting the physician.</p>	<p>“Just with the little things that people don’t think to tell you—hair loss for example, and you don’t know whether to attribute them to the meds or not, it sort of messes with self-perception . . . don’t know if should ask. Sleep loss etc ‘is it me, is it the meds? Should I ask about this’”—participant 6 (urban site)</p> <p>“Very quickly it was nice to be able to start them very soon after they were prescribed”—participant 5 (rural site)</p> <p>“ . . . I appreciate the idea of the study, I receive everything on time and even before my prescription ends.”—participant 7 (urban site)</p> <p>“[shipping time was] slower than ideal”—participant 8 (urban site)</p> <p>“[shipping time] depends on if it was over the weekend.”—participant 9 (rural site)</p> <p>“packaged well. Bubble wrap. Large box so it did not get crushed in mail.”—participant 10 (urban site)</p> <p>“The box for my insulin was still cold when I got it”—participant 11 (rural site)</p> <p>“except one time when the ibuprofen melted, [study pharmacist] did a good job of fixing the problem”—participant 12 (urban site)</p> <p>“The issue of not getting my medications on time is my fault because sometimes I can’t pick them up from the pharmacy or when delivered to the door”—participant 13 (urban site)</p> <p>“Usually [receive medicines before they ran out] but sometimes I didn’t know how many refills I had left and then I had to make an appointment with the Dr for renewal but it is difficult to be seen sometimes”—participant 14 (urban site)</p> <p>“there was one time I didn’t [receive medicines before running] but I called the pharmacist to remind him and then I got it”—participant 15 (urban site)</p>

their medications. However, a participant mentioned that information they received from the pharmacy was “a little different” and another participant had unanswered questions.

Theme 2: Delivery Service. Most participants said that their medications arrived quickly, and refills usually arrived before their medication was finished. However, a participant felt that shipping was slower than preferred, and another mentioned that sometimes, delivery was interrupted on weekends.

Generally, participants said that medications arrived in good condition as they were packaged well and were kept at the appropriate temperature. However, one participant reported that their medication appeared “melted” on receipt. Participants said that when medications arrived late, it was usually a result of the participant forgetting to call to request a refill or due to difficulties in contacting the prescriber.

Prescribers Focus Groups

Most often, prescribers commented on the pharmacy model when asked about their initial concerns regarding prescribing from only a short list of medications, and when asked about the instances of medication substitution. These comments reflected prescribers’ thoughts that allowing the pharmacist access to a participant’s health record was very helpful and they welcomed suggestions from the pharmacist regarding alternative medications to prescribe. A prescriber also mentioned that having medications mailed to participants’ homes was another important aspect of this pharmacy model as it helped to increase participants’ access to medications. Representative quotes are presented in Table 2.

Chart Stimulated Recall

Saturation of themes was reached after 30 chart reviews. The 2 major themes identified were that this pharmacy model allowed for improved drug therapy management and participant experience, and that it made pharmacy services more accessible to participants engaged with the study. Representative quotes are presented in Table 3.

Theme 1: Improved Drug Therapy Management and Participant Experience. With access to the EHR, the pharmacist was able to review participants’ medical histories and see prescribers’ efforts to help improve the participant’s health, such as efforts to support medication coverage. With this information, the pharmacist was able to provide advice to the participant that was consistent with that of their primary care team and encourage participants to adhere to treatment plans. For example, the pharmacist encouraged participants to complete diagnostic tests, such as bloodwork, as this

information was available in the EHR (see Table 3 for quotes). Knowledge of the participant’s complete primary care medical history, including mental health status, allowed the pharmacist to understand and address the participant’s concerns in an appropriate manner.

Access to the participant’s EHR made it possible to know the context in which medications were being prescribed and if they were being used appropriately, such as if pain medications were being prescribed frequently. The pharmacist was also able to identify participants with complex medical histories, including those using multiple antidepressants, for whom it might not have been in the best interest to switch medications. The ability to review participant’s current and previous medications in the EHR allowed the pharmacist to identify a dose change, of which the participant was unaware.

Theme 2: Made Pharmacy Services More Accessible to Participants. The pharmacist said that it was easy to contact most participants by telephone. The responses indicate that this model made pharmacy services more accessible to participants by allowing flexible timing for communications and enhanced privacy. In some cases, this pharmacy model served as a consistent source of health care advice despite visiting different health care providers.

For one participant, this model might have been worse than the regular community pharmacy model as the lack of physical interaction might have made the participant anxious.

Medication Substitutions

A total of 395 participants were enrolled in the intervention group of the trial. Nine participants withdrew consent; 386 participants were included in this study. We found that 163 unique substitutions occurred a total of 380 times.

Medication substitutions were initiated by the study pharmacist (292, 76.8%), doctor (32, 8.4%), participant (19, 5%), nurse practitioner (7, 1.8%), or other members of the health care team (2, 0.5%). A total of 28 (7.4%) substitutions were initiated jointly by the pharmacist, participant, doctor or nurse practitioner. About 60% of the substitutions (226) occurred on enrollment in the study (Table 4) and 85% (322) were from a medication not on the essential medications list (i.e. not provided for free in the trial) to one that was.

Medication Incidents

Thirty participants experienced a total of 38 unique medication incidents.

Most incidents related to problems with delivery (16) and were mainly due to closures on weekends or holidays, delivery not completed as scheduled and difficulties in

Table 2. Theme, Key Concepts, and Representative Quotes From Prescribers' Focus Groups.

Theme	Key concepts	Representative quotes
Support for the pharmacy model	Prescribers thought that allowing the pharmacist access to participant's health record was very helpful and they welcomed suggestions from the pharmacist regarding alternative medications to prescribe.	<p>"... but I got really good feedback with pharmacist in terms of, can we do this instead, so it was a nice dialogue between us: so if I had prescribed something that wasn't on the list, it was very easy to change it to something that was."—prescriber 1 (urban site)</p> <p>"I'm sure there was at least a number of switches, I can't recall the details ... but overall, it was really the pharmacist saying 'this medication is not covered, this is, here's how we can switch them, what do you think?' My response was always 'sure, sounds good!'"—prescriber 2 (urban site)</p> <p>"I think also ... that having a team or a shared care pharmacist that worked with us on recommending medications or updating patients on their renewals was just so invaluable, uh, I do have patients that gone through this study or have been on this study and while they've been on the study for now two or three years, they've acquired health benefits and they've decided to stay in the study purely due to our pharmacist, uh, because he's just great and he encourages the patients to make sure that they are taking their medicines appropriately. ... he alerts them when refills are due or encourages them to follow up with their family physician. Uh, just having that experience has been amazing."—prescriber 3 (urban site)</p> <p>"But I do think that in it is self has helped. Like so we've had this and that relationship is coming and they're going to likely have access to our chart and I think that's healthy to help promote and build a better community. So even the study had ... it weighs out ... so putting that pharmacist in there is now helping us say: We need our pharmacist, we need to change our model of care or not just a doctor and a nurse and a whatever. We need all of these people. So you know that helps."—prescriber 4 (rural site)</p> <p>"So the other thing is, we don't have any public transportation, right, so patients have their meds mailed to them which makes a difference. Because most of the time, they'll come to the emerg and can't even get to the pharmacy to actually go pick up their prescription so if it's in the office we can give it to them because even that makes a difference because there is no like ... it's just inaccessibility. So now if they come we give them a prescription and they are like "Well I can't get to the pharmacy for like 2 weeks or 3 weeks or whatever." It just ... all of those old things add up"—prescriber 4 (rural site)</p>
	A prescriber also mentioned that having medications mailed to participants' homes helped to increase access to medications	

Table 3. Themes, Key Concepts, and Representative Quotes From Chart Stimulated Recalls (CSRs) With the Study Pharmacist.

Themes	Key concepts	Representative quotes
Improved drug therapy management and participant experience	<p>With access to the EHR [electronic health record], the pharmacist was able to review the participant's history and efforts made by the prescriber to help improve the participant's health</p> <p>Knowledge of information in the EHR enabled the pharmacist to provide advice that was consistent with that of the participant's primary care team and encourage them to adhere to treatment plans.</p>	<p>"I was able to see [from the EMR (electronic medical record)] all of the notes around his diabetes management. He had lots of support . . . [I was able to see] dose adjustments, he had a cardiac condition as well. . . was able to see his blood work and his kidney functions as well. . . . I was able to check on those things."—CSR with chart 1</p> <p>"With the EMR, I was able to see there was so many efforts to get him medicine coverage, they were really struggling."—CSR with chart 2</p> <p>". . . because I had access to the EMR, I was able to counsel her, giving her consistent messaging that the doctor provide . . . so the messages were the same."—CSR with chart 3</p> <p>". . . because I knew some of her history, and I also saw some of the notes about how the doctor responded to her questions in the clinic, I was able to communicate to her in a similar way, like in a consistent way, so that she could see that we were working together."—CSR with chart 4</p> <p>"Because I had access to the EMR, I was able to document this well, so the family doctor could see I was also having this same difficulty with getting her, persuading her to start the treatment and the reasons why. So I think that was kind of important as well, given that the doctors also experiencing those difficulties. So we were able to collaborate and understand better this patient's adherence issues."—CSR with chart 5</p> <p>". . . when I would be taking to the doctor about renewing her medicine, the doctor would say well, you know, we're still like on the dose adjustment stage, she needs to get some bloodwork, and of course I would encourage her . . . it was, in my opinion, a good way to . . . use the EMR, cause I was able to actually see whether or not she got her bloodwork done . . . then I could give her a quick call and say . . . I think you might be running out of your medicine, and I know you haven't done your bloodwork yet, so I'm gonna just send you a two week supply for now so that it gives you enough time and it worked out. I sent her a few of these supplies where she was cutting it close. . ."—CSR with chart 6</p> <p>"I was able to see in the EMR that she had . . . like a mixed mental health diagnosis, that allowed me to understand a little bit more about . . . some of her paranoia . . . around me calling. . . she's never seen me before . . . but I was able to . . . explain . . . how the pharmacy services really work and that was really helpful."—CSR with chart 7</p> <p>". . . primary care would send me the new orders for pain medicines, I would be able to contact them to get like an authorization for another round of the pain medicines if needed, and then, I was able to see in the EMR, if she was using too much, right . . . I was able to see when the last time it was prescribed by her family doctor and if she indeed was using it more consistently or not so much and usually using it just for flareups . . . I thought that was helpful."—CSR with chart 8</p> <p>"I was able to see the reason why . . . she uses her asthma medicine fairly regularly is not because of lack of knowledge, or lack of counseling. I was able to see that she knows very well that it's because of the pets. So again, it goes back to the fact that . . . I didn't have to ask her the same questions over and over, I could see that she'd already been counselled and identified that these are the problems and she's accepting."—CSR with chart 9</p> <p>"I was able to see quite a complex history by having access to the EMR, which mainly has allowed me to assess whether or not it would be advisable to try to switch her to medicines that she could access for free. . . there's risk in offering her a different antidepressant where there is a higher risk, number one of side effects, number two, she was already on dual treatment which means she didn't have enough response from one medicine, they had to add on another one . . . which somewhat suggests that it's more complicated history of depression. So by having access to the EMR, I was able to see some of these things and do some chart review before actually trying to get her to participate in the research, it's safer."—CSR with chart 10</p> <p>". . . through the EMR, I was able to identify a dose mistake. It was a prescribed mistake by the cardiologist. The cardiologist thought he was on a certain dose of potassium. When I talked to the patient, they were not aware of any dose changes. Primary care took the cardiologist's consult notes and prescribed the new dose and I was able to catch that before dispensing it. So I was able to talk to the patient, clarified that they're not aware of any dose change, and it's a significant change . . . Cardiologist said okay, you're right, let's stay on that dose, I don't want to change it, we're gonna keep it exactly the same. So I contacted primary care, got that all clarified and made sure that no harm come to this patient"—CSR with chart 11</p>
	<p>Knowledge of the participant's history also allowed the pharmacist to address the participant's concerns in an appropriate manner</p> <p>The ability to view the participant's medical record also made it possible to know the context in which medications were being prescribed and if they were being used appropriately.</p> <p>The pharmacist was also able to identify participants with complex medical histories for whom it might not have been in the best interest to substitute medications.</p> <p>With access to the EMR, the pharmacist was also able to identify a dose change that the participant was not aware of.</p>	

(continued)

Table 3. (continued)

Themes	Key concepts	Representative quotes
Made pharmacy services more accessible to participants	<p>This model allowed participants to contact the pharmacist when they were available, and this made it possible to have longer conversations.</p> <p>Since participants did not meet the pharmacist in person and was able to speak to the pharmacist from any location in which they were comfortable, this model provided an opportunity for private counseling.</p> <p>This model also allowed participants to use the same pharmacy despite moving or visiting difference health care providers.</p> <p>The pharmacist felt that for one participant, this model might have been worse than the regular community pharmacy model.</p>	<p>"... he was able to call me when he was between his own work and his own appointments and we had those really good discussions at length about his health and exercise and importance of treating blood pressure, the importance of reducing the risk of heart attack and stroke. So those things, we never saw or met each other in person but we seem to have a lot of good discussions about health promotion and disease prevention."—CSR with chart 12</p> <p>"Oh, and I also think it offered her some privacy. So, she's younger and ... when I called her, she'd be able to speak ... openly about her health conditions and it's because she would take the call in her room, right? And it would be private ... it could be as long as she'd want it to be, we didn't have a limit on counseling, so as opposed to how it was in a community pharmacy ... although counseling's available, it's not always the best place to get it. Sometimes better if you get it in the privacy of your own home."—CSR with chart 13</p> <p>"... because of costs, they were buying their medicine from a pharmacy that's very far ... it was like a discount pharmacy. ... So they would get their medicine from there and having it delivered directly to them I think was really helpful."—CSR with chart 11</p> <p>"I think the mailing was a good option because this man works a lot at his own business and I basically shipped directly to his business so I think it was much more convenient for him."—CSR with chart 14</p> <p>"I don't think it improved it, I think it was maybe worse, can imagine you know, she might have been stressed out with somebody calling her telling her they're going to send her medicines."—CSR with chart 7</p>

Table 4. The Frequency of Medication Substitutions at Different Times in the Trial.

Time at which medications substitutions occurred	Frequency	Percentage
On enrollment in the study	226	59.5
Later in the study	113	29.7
On starting medication	41	10.8

locating the participant's address. These incidents affected a total of 13 participants, and 6 of these incidents contributed to or resulted in temporary harm.

Most incidents relating to adherence (12) resulted from either delivery problems, participants not taking medications as prescribed, or miscommunication between participants, prescribers and the pharmacist. These affected a total of 11 participants and temporary harm was reported in 4 incidents.

Seven incidents occurred in which participants received an incorrect dosage of a medication and these affected 6 participants. Most often, these incidents resulted from participants taking a higher dose than prescribed or being prescribed a dose lower than what they previously used. One incident caused temporary harm as the participant took a "double dose" of a combination medication and experienced side effects related to receiving a dose higher than recommended for one of the medications.

Miscommunication between participants, prescribers and the pharmacist caused 5 medication incidents, and affected 5 participants. One of these incidents resulted in temporary harm as the intervention group participant stopped taking some medications due to costs, since they did not receive on-list medications from the research pharmacy. There were 4 incidents involving 4 unique participants who were not able to locate their medications, none of which resulted in temporary harm.

In both incidents relating to substitution, participants reported that they were harmed temporarily as they experienced side effects after switching from a medication that is not on the list to one that is. In the interaction incident, the pharmacist identified interactions between a newly prescribed medication and a medication the participant was taking. In the incorrect medication incident, the wrong brand of glucometer testing strips was sent to the participant. Harm was not reported in the interaction nor incorrect medication incident.

Discussion

Pharmacist access to EHR information facilitated collaborative care with prescribers according to prescribers and the study pharmacist, especially around medication substitutions. This was supported by participants who found it easier to obtain information about their medications through this model. Participants were pleased to receive medications in the mail and problems with delivery were rare and usually not associated with any delays in treatment or harms. We also found that the pharmacist utilized the EHR to suggest and

coordinate medication substitutions with primary care. This supports the finding from our analysis of the medication substitutions, which indicated that most were initiated by the pharmacist. Eighty-five percent of substitutions (322) were from a medication not on the essential medications list to one that was, and this was the result of providing free access to only a short list of essential medications.

Our finding that the study pharmacist used the EHR to help ensure the rational use of medications is consistent with the results of a randomized controlled trial which found that intervention group community pharmacists who were allowed access to patients' health records identified significantly more medication related problems and omissions in preventative care than control pharmacists without access to patient's health records.³ Other studies conducted with physicians and family medicine graduates in Canada found that they thought that patient information (and preferably information in the EHR) should be shared across care settings and they supported sharing information with community pharmacists, respectively.^{14,15} We found that participants were satisfied with medication deliveries and this is also consistent with a study done with the Veterans Administration Consolidated Mail-Order Pharmacy system, which found that 88% of patients felt that their medications almost always or usually arrived on time.¹⁶ Since this pharmacy model provided the pharmacist access to information to determine appropriate medication substitutions, wide adoption of this pharmacy model might facilitate implementation of a formulary consisting of only a short list of essential medications.

Limitations

Since the patient experience questionnaire was administered as part of the trial and without the specific aim to learn about patients' experiences with this novel pharmacy model, these results may not be representative of all participants' impressions. The focus groups with prescribers were also conducted for a study with a different aim and so, the results reported here may also not represent all prescribers' impressions. We were also not able to compare comments made by patients and prescribers who utilized this pharmacy model with those who did not. Since there was only 1 study pharmacist in the trial, the chart stimulated recalls were done with the same pharmacist and there is possibility for recall bias. Due to the qualitative nature of the patient experience questionnaire, prescriber focus groups and chart stimulated

recalls, our position may have influenced these components and results, although we also provide quantitative information about medication substitutions and incidents.

Conclusion

A pharmacy model that provided the pharmacist access to patients' EHRs and mailed medications to participants allowed the pharmacist and prescribers to collaborate in prescribing appropriate medications. This model also improved participants' access to pharmacy services and was supported by participants and prescribers. Future work should aim to explicitly determine acceptance of this model to a wider population and examine the financial implications of this model, if adopted on a broader scale.

Author Contributions

MZA gathered and interpreted the data, wrote the first draft of the manuscript and contributed to revisions of the manuscript. NP designed the study, interpreted the data and contributed to revisions of the manuscript. NU gathered the data and contributed to revisions of the manuscript.

Declaration of Conflicting Interests


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