RESEARCH

Impact of a contactless prescription pickup kiosk on prescription abandonment, patient experience, and pharmacist consultations

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ABSTRACT

Objective: Investigate the impact of increased access to new and refilled prescriptions by means of an automated pickup kiosk (Asteres ScriptCenter) on prescription abandonment rates, patient experience, and pharmacist consultations.

Design: Nonrandomized, observational study using retrospective, deidentified data from the filling pharmacy, the kiosk, and a pharmacist-completed counseling documentation log over a 35-month study period.

Setting and participants: Hospital employees opting to use a kiosk located in the lobby with 24 hours a day, 7 days a week access for pickups and a telephone pharmacist consultation service compared with employees using the regular counter at the filling pharmacy.

Outcome measures: Return to stock (RTS) rate to assess prescription abandonment, time to prescription pickup, consultation duration, kiosk user assessment, and pharmacist assessment of counseling ability.

Results: Approximately 9% of employees (440) enrolled to use the kiosk, with 5062 kiosk pickups recorded for new prescriptions (29%), refill prescriptions (33%), and over-the-counters (38%). The mean kiosk RTS ($4.3\% \pm 3.2$) was lower than that at the regular counter ($5.6\% \pm 0.8$), $P = 0.04$, whereas the mean time to pickup was approximately 1 day greater at the kiosk than the regular counter (2.8 ± 0.4 vs. 1.8 ± 0.2, $P < 0.001$). The average kiosk consultation was approximately 1 minute shorter (2.0 ± 1.4) than that of the regular counter (3.4 ± 1.9, $P < 0.001$), and fewer patients using the kiosk (15.7%) had additional questions at the end of a consultation session than patients at the regular counter (38.8%, $P < 0.001$). Most of the kiosk users agreed that their prescription questions were answered and that kiosk convenience was an important reason for using the filling pharmacy. Almost all (>90%) pharmacists indicated that they were able to effectively counsel patients at the kiosk and the regular counter.

Conclusion: The kiosk, used by self-selected health care workers located in a hospital workplace setting with 24 hours a day, 7 days a week access, was a convenient, contactless pickup extension of the filling pharmacy with a lower prescription abandonment rate and similar pickup and consultation characteristics as at the regular pharmacy counter.

Background

Poor medication adherence is known to be associated with increased hospitalization, worse health outcomes, and increased health care costs.[1] The World Health Organization included this statement as a key take-home point in its report

Key Points

Background:

- Prescription abandonment, when a prescription is filled but the patient does not pick up, contributes to primary medication nonadherence and is important to a pharmacy from a business and patient outcome perspective.
- Abandonment rates differ by prescription type and are a particular problem for brand name medications, with an abandonment rate almost 3 times higher (21.3%) than that for generics (8.1%).
- An automated pickup kiosk that patients can use to pick up their prescriptions that have already been ordered, filled, and verified by a pharmacist in an outpatient pharmacy is a possible solution to improving prescription abandonment rates.

Findings:

- A lower prescription abandonment rate and similar pickup characteristics were observed for patients using an automated prescription pickup kiosk compared with patients using the regular pharmacy counter.
- Pharmacists agreed that their ability to counsel patients using the kiosk was similar to patients at the regular counter.
- Patients were satisfied with pharmacist access and kiosk operations.

on adherence to long-term therapies: "Increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments."[2]

Medication nonadherence is divided into 2 subtypes: primary and secondary nonadherence.[3] Many studies examine secondary medication nonadherence, which occurs when an original prescription is filled and picked up by the patient, but it is not taken or refilled as directed after pick up. Although less studied, the elements of primary medication nonadherence (PMN) are equally important. PMN is when a new medication is prescribed for a patient, but the patient does not obtain the medication. This includes prescriptions that never reach the pharmacy and those that do but are never filled or picked up (i.e., abandoned). Abandonment rates differ by prescription type and are a particular problem for brand name medications, with an abandonment rate almost 3 times higher (21.3%) than that for generics (8.1%).[4] Prescription abandonment, filled or refilled but never picked up, is important to a pharmacy from a business and a patient outcome perspective.

From a business view, abandoned prescriptions result in the need to return medications to stock, which has an associated labor cost and can cause overstocking, which means wasted dollars on the pharmacy shelf. From a patient outcome perspective, abandoned prescriptions can be an indicator of patient nonadherence problems and can influence pharmacy Star Ratings.[5] Although there are many reasons why patients

do not pick up their prescriptions, technology to improve convenience of prescription pickup could help reduce prescription abandonment rates. In addition, a technology that allows contactless pickup has taken on added significance in the coronavirus disease 2019 (COVID-19) pandemic that has not only highlighted community pharmacists as frontline providers but heightened the need for contactless means of prescription delivery.

Automated prescription dispensing or delivery devices, sometimes thought of as "prescription kiosks or lockers," offer a contactless prescription pickup option and may help decrease PMN by increasing the ease of the patient's first step toward adherence; picking up their medications. Automated prescription kiosks for both dispensing and pickup were launched in the early 2000s as a way for patients to obtain their prescriptions safely and conveniently. Two main types of technology used today are as follows:

(1) Automated dispensing kiosks, primarily used in urgent care centers and clinics, allow patients to receive commonly prescribed medications dispensed directly to them after visiting with a health professional.
(2) Automated pickup kiosks, the subject of this study, are used for patients to pick up their prescriptions that have already been ordered, filled, and verified by a pharmacist in the dispensing pharmacy.

Both types of automated prescription kiosks are designed to be used with the appropriate patient counseling as required by local laws and regulations. Although these automated devices may be helpful, there is little evidence available to assess the impact of these kiosks on prescription abandonment rates and pharmacist-patient consultations.[6]

The impetus for this study was directly related to this lack of evidence. Sharp Rees-Stealy (SRS) Pharmacy in San Diego, CA submitted a request to the California Board of Pharmacy to install 1 type of automated kiosk, an automated prescription pickup kiosk (Asteres ScriptCenter), in the Sharp Memorial Hospital (SMH) lobby located 0.2 miles from the SRS pharmacy. An SMH employee interest survey fielded by SRS had revealed 70.4% of respondents agreed that they would benefit from being able to pick up their prescription at SMH, and 68.5% agreed that they would be more likely to pick up their medications if they had easier access to retrieving their medications. However, at the time of the SRS request, the California Board of Pharmacy Code of Regulations, Title 16, Division 17, Section 1713(d), regarding delivery of prescriptions, allowed the kiosk to deliver only previously dispensed (refill) prescription medications, and the kiosk had to be located adjacent to the secure pharmacy area.[7] In an effort to investigate the impact of delivering both new and refill prescriptions at a nonadjacent location, the Board of Pharmacy issued a waiver to SRS to operate the kiosk with the stipulation that a study would be conducted concurrently.

The purpose of this study was to investigate the impact of increased access to new and refilled prescriptions by means of the automated pickup kiosk (Asteres ScriptCenter) on prescription abandonment rates, patient experience, and pharmacist consultations. SRS expected that patients would be more likely to pick up their prescriptions because of the convenience of the onsite kiosk while having a similar

relationship with their pharmacist as they would at the regular counter.

Objectives

The primary objective of this study was to compare the prescription abandonment rate between patients using a kiosk and patients using a regular pharmacy counter in a hospital employee population. The secondary objectives were to compare time to prescription pickup and the number of questions asked after a pharmacist consultation between the 2 delivery modes, regular counter and kiosk. Patient experience with the kiosk and pharmacist-rated ability to effectively counsel patients using a kiosk were also assessed.

Methods

This study was a nonrandomized, observational study that used retrospective, deidentified data gathered from both the filling pharmacy (SRS) and the kiosk. The study period included a 6-month regular counter, before kiosk installation, period (September 1, 2015-February 28, 2016) and a 35-month period (March 1, 2016-January 31, 2019) during which the kiosk and regular counter operations occurred in parallel.

SMH employees were sent an e-mail giving them the option to pick up their (and their dependents') new or refilled prescriptions, as well as over-the-counter (OTC) medications, either through the ScriptCenter automated prescription pickup kiosk located in the SMH lobby or at the regular pharmacy counter in the SRS outpatient pharmacy located 0.2 miles away. ScriptCenter is equipped with various security features to prevent the diversion and unauthorized access to the kiosk. The automated prescription pickup kiosk weighs more than 1300 lbs (5897 kgs), is bolted to the floor, interfaces with the pharmacy management system for real-time prescription tracking, uses security codes and biometric technology for both patient and pharmacy access, and captures a photo and signature of every patient picking up their prescription. Normal operating hours at the regular pharmacy counter were 8:30 AM-5:30 PM, Monday through Friday. The kiosk was accessible 24 hours per day, 7 days a week. All prescriptions were filled and verified at the SRS pharmacy during regular business hours, with kiosk prescriptions delivered to the kiosk daily. OTC products were not preordered, rather they were stocked in the kiosk as needed and included common products related to allergy, digestion, pain, cough, cold, and vitamins.

New prescriptions in the kiosk required mandatory consultation with the pharmacist (as required for any new prescription in California), and pharmacists used their professional judgment to determine whether a refilled prescription required consultation. Patients requiring consultation were notified (text or e-mail) of need for consultation before being able to pick up their prescription. The patients then could call back from their personal phone or from the phone adjacent to the kiosk. The patients had the ability to call at any time that was convenient for them and did not need to be at the kiosk at the time of the phone consultations. After required consultations were conducted, the pharmacist electronically released the prescription in the kiosk for pickup. For additional questions, the SRS pharmacy service phone number was provided on the kiosk for patients, and calls were answered by the SRS pharmacy during business hours and by an SRS pharmacist who was on call after hours. At SRS, the pharmacist supervisors have a weekly on-call schedule, and after hours, the phone call was routed by the SRS call center to the on-call pharmacist. The patients paid for their medications at the kiosk using a credit or debit card.

Although pharmacist counseling for new prescriptions occurred as part of the normal operating procedures of SRS pharmacy (as required by law), documentation of the counseling sessions was not as detailed as needed for this study. A counseling documentation log was developed for the pharmacists to document each counseling session for a patient with a new prescription during prespecified data collection periods (Appendix 1). The documentation included the number of prescriptions (new and refill) that a patient was picking up, the time and duration of the counseling session, if a patient had additional questions at the end of a consultation session (if so, the number and the type), and the pharmacist's rating of their ability to counsel patients effectively (0 = not able, 4 = fully able) for 3 elements (building a therapeutic relationship, establishing a management plan, negotiating safety netting strategies). Each counseling session may have included multiple prescriptions (new or refill). Counseling sessions were documented for the kiosk for 15 months (March 1, 2016-December 12, 2016 and October 1, 2017-February 28, 2018). Because the volume of new prescriptions at the regular counter was much larger than the volume at the kiosk, a sampling plan was used to collect data for a similar number of new prescription sessions as had been documented at the kiosk during the study time period. Regular counter consultation data were collected during five 1-week periods (in May, June, December 2016 and November, December 2017). Collecting data for an entire week for all new prescription counseling sessions was expected to reduce bias that may occur if specific times or day(s)s had been selected. As at the regular counter, kiosk prescriptions were defined as "new" if either transferred into the SRS pharmacy, renewed to a new prescription number, had not been previously taken by the patient, or included a change in dosage form, strength, or directions for use. A designation of "truly new" to the patient excluded prescriptions renewed to a new prescription number (without changes) and only occurred for the subset of documented consultation sessions from October 1, 2017 through February 28, 2018 after an inquiry from the Board of Pharmacy highlighted the value of making this distinction for analyses. Pharmacists counseled if a medication was either transferred into the SRS pharmacy, had not been previously taken by the patient, or included a change in dosage form, strength, or directions for use as required by law or as needed per the pharmacist's clinical judgment.

Return to stock (RTS) rate was used to assess prescription abandonment with a lower RTS rate indicating more patients had picked up their prescriptions. The RTS and the time to prescription pickup were calculated as part of SRS Pharmacy's normal operating procedures. The RTS rate was a summary measure, based on new and refill prescriptions, calculated on a monthly basis over the study period as the monthly number of prescriptions returned to stock after a 14-day period divided by the number of prescriptions filled over the month period. The time to prescription pickup was a summary measure,

including new and refill prescriptions, calculated on a monthly basis over the study period as the interval between when the pharmacist verified the prescription and when the patient picked up the prescription. Consultation variables collected included the duration of the counseling session, if patients had more questions at the end of the consultation and the number of questions, and pharmacist-rated ability to effectively counsel patients using the kiosk were assessed by a questionnaire completed by the pharmacist after each session. RTS, time to prescription pickup, and consultation variables were compared between the groups over the study period. For all comparisons, the regular counter group included Sharp employees and dependents only to match patients using the kiosk more closely in the SMH location. Patient experience with the kiosk was rated by kiosk users by a voluntary, 4-question survey at the completion of the patient's second kiosk session as part of the normal operating procedures of the kiosk. If a patient skipped a question, the remaining questions were not presented to the patient. No patient identifiers were recorded for any data collected.

To achieve 95% power using the primary outcome of RTS, a sample size of 820 pickup events was required for both the regular counter group and the kiosk group. Pearson's chi-squared test was used to compare categorical variables and 2-sample t tests were used to compare continuous variables between groups. This study was approved by the University of California San Diego and Sharp HealthCare Human Research Protection Programs.

Results

SMH employed 4820 people during the study period; 54% working day shift and the remaining 46% working evening or variable shift. Approximately 9% (440) of the employees enrolled to use the kiosk. Over the 35-month study period, there were 5062 kiosk pickups fairly evenly split among new prescription (29%), refill prescription (33%), and OTC (38%) pickups. Most (approximately 70%) of the prescription (new and refill) pickups at the kiosk were during regular pharmacy hours, whereas OTC pickups were more evenly split between regular pharmacy hours (55%) and after hours (45%). Of the patients answering the kiosk survey questions (n = 158), most believed the questions regarding their prescriptions had been answered, they knew where to call if they had more questions, and the convenience of after-hours pickup at the kiosk was an important reason to use the SRS pharmacy (Table 1). Anecdotally, there were no complaints received by the filling pharmacy nor the California Board of Pharmacy regarding the kiosk operation nor reports of patients receiving the wrong prescription.

The mean RTS at the kiosk (4.3% ± 3.3, 95% CI 3.1–5.4) was lower than that at the regular counter (5.6% ± 0.9, 95% CI 5.3-5.9) during the study period ($P = 0.02$) and similar to the mean at the 6-month regular counter, before kiosk installation, period (5.2% ± 1.2, $P = 0.53$, data not shown) (Table 2). The mean time from prescription verification to pick up was approximately 1 day greater at the kiosk compared with the regular counter (2.8 ± 0.4 vs. 1.8 ± 0.2 respectively, $P < 0.001$).

Based on data from the 15-month consultation data collection period, the average consultation was approximately 1 minute shorter at the kiosk (2.0 ± 1.4) than the regular counter (3.4 ± 1.9, $P < 0.001$) (Table 3). Fewer patients using the kiosk had additional questions at the end of a consultation session (15.7%) than those using the regular counter for pickup (38.8%, $P < 0.001$), although for the patients with questions, the mean number was approximately 1 for each group ($P = 0.67$). When the limited subset of patients with a truly new prescription were considered (kiosk n = 46, regular counter n = 104), a shorter consultation duration (kiosk 2.6 ± 1.4, regular counter 3.3 ± 1.6) and fewer patients with a question at the end of consultation (kiosk 7% vs. regular counter 46%) were similarly observed. More than 90% of the pharmacists' ratings of their ability to counsel patients were a 3 or a 4 (4 = fully able) at both the regular counter and the kiosk for the 3 elements assessed (build a therapeutic relationship, establish a management plan, negotiate safety netting strategies) (Table 4).

Discussion

In this hospital employee population, the prescription abandonment rate was lower for patients opting to use an automated kiosk for prescription pickup than that observed for patients using the regular counter in the associated filling community pharmacy 0.2 miles away from the hospital. The time from prescription verification to pickup was approximately 1 day longer, and the average prescription consultation time was approximately 1 minute shorter for the patients using the kiosk than the patients at the regular counter. Fewer patients using the kiosk had questions for the pharmacist at the end of their consultation session, although the average number of questions was only 1 for those asking questions at the kiosk and regular counter. When the subset of truly new prescriptions was considered, the 1-minute duration difference and the proportion of patients with questions were similar. The hospital employees electing to use the kiosk agreed that any questions they had regarding their prescription were answered and that the convenience of being able to pick up prescriptions at the hospital-located kiosk was an important reason as to why they used the filling pharmacy.

Table 1
Patient experience with kiosk

Question	Total, n = 158	Yes	No
Do you feel your questions were answered regarding the prescriptions you picked up today?	146[a] (92)	88 (96.7)	3 (3.3)
Is the convenience of after-hours prescription pickup an important reason to use this pharmacy?	128 (81)	105 (82.0)	23 (18.0)
Is the kiosk a main reason for you to use this pharmacy?	111 (70)	106 (95.5)	5 (4.5)
If you have questions for a pharmacist regarding the prescriptions you picked up today, do you know where to call?	109 (69)	78 (72.0)	31 (28.0)

Note: Values are given as n (%).
[a] Including 55 who had no questions.

Table 2
Return to stock rates and time from verify to pick up at regular counter versus kiosk

Rate and time characteristics	Regular counter[a]	Kiosk
RTS rate		
Total Rx filled	104,702	3260
Total Rx picked up	98,799	3119
Total Rx RTS	5903	141
% RTS, mean $\pm$ SD (95% CI)[b]	5.6 $\pm$ 0.9 (5.3−5.9)	4.3 $\pm$ 3.3[c] (3.1−5.4)
Time from verify to pick up		
Days, mean $\pm$ SD[b]	1.8 $\pm$ 0.2	2.8 $\pm$ 0.4[d]
Hours, mean $\pm$ SD[b]	43.4 $\pm$ 5.1	66.1 $\pm$ 10.3
Range	4 s−30.2 d	7 min−28.9 d

Abbreviations used: Rx, prescription; RTS, return to stock.
[a] Regular counter: employees and dependents only to mirror group using kiosk.
[b] Monthly mean over study period.
[c] $P < 0.05$ kiosk versus regular counter.
[d] $P < 0.001$ kiosk versus regular counter.

Similarly, almost all pharmacists indicated that they were able to counsel patients effectively at the kiosk and the regular counter.

The expectation of the SRS Pharmacy that patients would be more likely to pick up their prescriptions because of the convenience of the onsite kiosk while having a similar relationship with their pharmacist was supported by the study results. The difference of approximately a 1% point difference in RTS rate, although small, has operational significance in that returning a prescription to stock requires employee time to physically return medications to stock while retaining proper labeling (e.g., National Drug Code, expiration date) as well as reversal of third party payer claims. The SRS Pharmacy estimated the cost of an RTS prescription to be $30 through its Six Sigma efforts to increase efficiency and identify waste reduction strategies. Considering 40,000 prescriptions filled per year at SRS pharmacy, reducing RTS by 1% point yields $12,000 in annual savings. From a patient outcome view, the 1% point improvement would mean that the patient population would take the first essential step toward adherence, picking up their medications, 400 more times each year. The prescription pickup characteristics and the pharmacists' assessments of counseling sessions were similar between pickup options, and kiosk users were satisfied with their access to pharmacist counseling. After presenting the study results to the California Board of Pharmacy, the Board decided to move forward and sponsor Senate Bill 1447. The subsequent law was enacted in July, 2019 to allow for automated pickup systems such as the ScriptCenter to be placed anywhere within pharmacies, hospitals, correctional facilities, clinics, and medical offices throughout California to deliver new and refill prescriptions to patients 24 hours a day, by 7 days a week.

From a wider perspective, consumers want convenience, and automation to provide a self-service option is increasingly expected.[8] Self-service options in pharmacy are a growing trend in both health care and retail settings. Improving employee and patient satisfaction (e.g., by offering 24 hours a day, 7 days a week access to prescriptions) and significantly reducing pharmacy lines would be important goals for a hospital system. In commercial retail settings, pharmacies are adding a higher level of convenience and frictionless checkout options to their shopping experiences. Community pharmacy is directly affected by this trend as evidenced by the rise in mail-order prescription delivery and the increased use of automated prescription dispensing and pickup solutions. Whereas dispensing solutions take the actual filling of the prescription out of the pharmacists' hands, automated pickup solutions allow for the normal processing of a prescription and provide a secure, regulatory compliant extension for will-call pharmacy pickup, allowing pharmacists to spend more time working at the top end of their license on more clinically relevant tasks and providing a method for remote pickup of prescriptions that could be useful in remote areas or for areas closer to patient workplaces.

The use of an automated prescription pickup kiosk offers an advantage of contactless prescription pickup, the importance of which could not have been imagined before the COVID-19 pandemic. As the shutdown of states progressed, community pharmacists became known and highlighted as frontline responders providing essential health care services. In addition

Table 3
Patient consultations at regular counter versus kiosk[a]

Variable	Regular counter[b]	Kiosk
No. consultation logs	255	223
Duration of consultation, min, mean $\pm$ SD	3.4 $\pm$ 1.9	2.0 $\pm$ 1.4[c,d]
Patients with questions at end of counseling session, n (%)	99 (38.8)	35 (15.7)[d]
No. questions for patients with more questions,[e] mean $\pm$ SD	1.2 $\pm$ 0.7	1.1 $\pm$ 0.6

[a] Documented counseling sessions: kiosk 15 months (March 1, 2016−December 31, 2016 and October 1, 2017−February 28, 2018), regular counter five 1-week periods (in May, June, December of 2016 and November, December 2017).
[b] Regular counter: employees and dependents only to mirror group using kiosk.
[c] Missing data: 37 counter and 9 at kiosk: pharmacist did not record.
[d] $P < 0.001$ kiosk versus regular counter.
[e] $P = 0.67$ kiosk versus regular counter.

Table 4
Pharmacist-rated ability to effectively counsel at regular counter versus kiosk[a]

Ability Description	Fully able 4	3	Partially able 2	1	Not able 0
Ability to build a therapeutic relationship with patient					
Regular counter[b] n = 246 N/A = 9	147 (59.8)[c]	94 (38.2)	4 (1.6)	1 (0.4)	0 (0.0)
Kiosk n = 143 N/A = 57	95 (66.4)	42 (29.4)	5 (3.5)	0 (0.0)	1 (0.7)
Ability to establish a management plan with patient					
Regular counter n = 220 N/A = 30	128 (58.2)	90 (40.9)	2 (0.9)	0 (0.0)	0 (0.0)
Kiosk n = 92 N/A = 88	58 (63.0)	28 (30.4)	3 (3.3)	1 (1.1)	2 (2.2)
Ability to negotiate "safety netting" strategies with patient					
Regular counter n = 204 N/A = 36	119 (58.3)	83 (40.7)	2 (1.0)	0 (0.0)	0 (0.0)
Kiosk n = 109 N/A=87	66 (60.6)	36 (33.0)	3 (2.8)	2 (1.8)	2 (1.8)

Note: N/A is not applicable to the counseling session per pharmacist.
[a] Documented counseling sessions: kiosk 15 months n = 219 (March 1, 2016–December 31, 2016 and October 1, 2017–February 28, 2018), regular counter n = 258, five 1-week periods (in May, June, December of 2016 and November, December 2017).
[b] Regular counter = employees and dependents only to mirror group using kiosk.
[c] Percentages in table are of total not including N/A and no response.

to ensuring patients received their medications through extra measures such as emergency refills and home delivery, pharmacists also provided an array of direct patient care services. As patients avoided emergency departments, clinics, and doctors' offices, pharmacists increased their delivery of medication therapy management services to help patients manage their chronic medications. Pharmacists are now adding the ordering and administering of COVID-19 testing to their role that already included providing immunizations, which will be needed when a vaccine for COVID-19 is available. Having a contactless automated prescription pickup kiosk, coupled with safety protocols (e.g., physical distancing, masking, and enhanced sanitation), can help pharmacies expand their geographic radius for the remote pickup of prescriptions at the same time freeing up pharmacists and other pharmacy-based staff to provide a growing array of direct patient care services while reducing patron density in pharmacies.

This observational study, with a limited sample size for the kiosk overall and compared with the regular counter, was conducted in a single site with employees of 1 health system. Patients were not randomized to use the kiosk versus the counter but rather were allowed to opt in to kiosk use as would occur in real-world settings. There was limited marketing of the kiosk through e-mail to employees, which could have had implications for the types of patients opting to use the kiosk, possibly for those with greater use of e-mail within their job activities. Future studies should look at a wider patient population, as there may be some inherent bias in using only hospital employees. For example, it may have been easier to convey information to hospital employees about the kiosk or prescriptions than it would be to employees in another nonhospital setting. Similarly, health care employees may be less likely to experience PMN owing to their knowledge base. Demographic data were not collected in this study, however, future studies should examine differences among patients opting to use the kiosk (e.g., age groups, medication knowledge base, health seeking and adherence behaviors) that were unknown in this study but could have contributed to differences observed within this study. During this study period, the kiosk did not use a video function that is now the standard with this manufacturer (Asteres), thus, an assessment of this enhancement should be conducted. Although kiosk users and pharmacists had positive assessments of the kiosk as a prescription delivery method, the cost-benefit analysis for the institution remains to be conducted and would likely vary among various populations.

Conclusion

The automated prescription pickup kiosk, ScriptCenter, used by self-selected health care workers located in a hospital workplace setting with 24 hours a day, 7 days a week access was a convenient, contactless pickup option, with a lower prescription abandonment rate than the comparator regular counter pickup option. Kiosk users were satisfied with their access to pharmacist counseling, and pharmacists rated the counseling sessions similarly between the kiosk and the regular counter.

Acknowledgments

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Appendix 1

Questionnaire for pharmacist assessment of patient consultation

Patient has: (write in number) _____ New Rxs _____ Refill Rxs	Introduction (Build a Relationship)		Action (Incorporate Patient's Understanding)		Closing (Safety Net Strategy)	
Call day & time: **Call duration:** **Consult:** (check one) ____ Counter for regular patient ____ Phone for regular patient ____ Phone for kiosk patient **Consult Initiated by:** (circle one) Pharmacist Patient	1. Introduce self 2. Explain role of pharmacist 3. Confirm patient ID 4. Discuss consult purpose: • Structure • Desired length 5. Has the patient previously talked with a pharmacist about this/these medication(s)? 6. Invite patient to discuss: • Medication concerns • Health related concerns	Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No	1. What med is for: 2. How to take med: • Time of day • Length of therapy • Missed dose 3. What to expect: • Efficacy • DDI • S/E 4. Invite patient to teach back: • Patient understands • Questions answered 5. Lifestyle and prevention: • Additional information • Referral	Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No, N/A Yes or No, N/A Yes or No, N/A	1. What to do if patient had difficulties following the plan: Yes or No 2. Future appointment or contact provided: Yes or No 3. Opportunity to ask additional questions: Yes or No PHARMACIST ASK PATIENT Do you have any more questions about your medication(s) I haven't answered yet? (check No/Yes and write in number) _____ No _____ Yes Write in Number of Questions _____ What questions did the patient have?	
Pharmacist-Assessment	Ability to *build therapeutic relationship* with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4		Ability to *establish a management plan* with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4		Ability to *negotiate "safety netting" strategies* with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4	
Comments						

Patient has: (write in number) _____ New Rxs _____ Refill Rxs	Introduction (Build a Relationship)		Action (Incorporate Patient's Understanding)		Closing (Safety Net Strategy)	
Call day & time: **Call duration:** **Consult:** (circle one) Counter Phone **Initiated by:** (circle one) Pharmacist Patient	1. Introduce self 2. Explain role of pharmacist 3. Confirm patient ID 4. Discuss consult purpose: • Structure • Desired length 5. Has the patient previously talked with a pharmacist about this/these medication(s)? 6. Invite patient to discuss: • Medication concerns • Health related concerns	Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No	1. What med is for: 2. How to take med: • Time of day • Length of therapy • Missed dose 3. What to expect: • Efficacy • DDI • S/E 4. Invite patient to teach back: • Patient understands • Questions answered	Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No Yes or No	1. What to do if patient had difficulties following the plan: Yes or No 2. Future appointment or contact provided: Yes or No 3. Opportunity to ask additional questions: Yes or No PHARMACIST ASK PATIENT Do you have any more questions about your medication(s) I haven't answered yet? (check No/Yes and write in number) _____ No _____ Yes Write in Number of Questions _____	
Rx Pickup: (circle one) Counter Kiosk			5. Lifestyle and prevention: • Additional information • Referral	Yes or No, N/A Yes or No, N/A Yes or No, N/A	What questions did the patient have?	
Pharmacist-Assessment	Ability to *build therapeutic relationship* with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4		Ability to *establish a management plan* with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4		Ability to *negotiate "safety netting" strategies* with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4	
Comments						