



Decreasing Waiting Time for Outpatient Chronic Prescriptions Pickup Using Drive through 24/7 Automated Dispensing Carousel System at King Salman Military Hospital (KSAFH)

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<p>Abstract: Extended waiting periods have an effect on healthcare accessibility and delivery. The main purpose of drive through 24/7 automated dispensing carousel system is reducing the necessity for patient to visit the hospital to dispense his/her chronic medications, increasing patient's convenience and relieving congested parking spaces in the hospital. Several methods have been implemented in other countries to reduce patient waiting time. Some of which include automated dispensing system, staff scheduling plan, postal-delivery prescription, and redesign of pharmacy workflow [1-4]. In SAUDI ARABIA, one of the methods adopted was implementation of drive through 24/7 automated dispensing carousel system (DAD). DAD was developed to make patients' chronic prescription pickups easier. The hospital has implemented Capsa Healthcare's RoboWall as a drive-through model for the first time in the global market at King Salman Armed Forces Hospital (KSAFH) to facilitate the convenient delivery of prescription drugs to patients. DAD is a collection of innovative dispensing systems that offers patients new concepts for dispensing their prescription. Pharmacy tech workstations generally have barcode-driven internal workstations, flat screen displays facing patients, Robowall software, and SMS (text messaging) modules. This project will assess were to (1) assess the effectiveness of drive through 24/7 automated dispensing carousel system in improving waiting time for outpatient chronic prescriptions pickup and determine the feasibility of this system in a busy tertiary military hospital. Data will be extracted from routinely queuing system, hospital information systems, and patient experience. The aim of this study will focus on and explore the current practice and its barriers to waiting time for outpatient chronic prescriptions pickup. Where possible, generalize the study to other military hospitals among the Ministry of Defense and other health care providers at SAUDI ARABIA.</p>	<p align="center">Research Paper</p>
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INTRODUCTION

I. Problem Description

The average wait time for prescription pickup at the outpatient pharmacy in King Salman Military hospitals was 3.5 hours.

Currently, all patients have to visit the hospital at least once a month to pick up their prescriptions from pharmacy; about two-thirds of them needed a chronic medication refill. This resulted in overcrowding, congested parking spaces, poor patient experience, operational inconveniences that led to high patient dissatisfaction, decreased patient safety, low quality

care, and even illness transmission—especially for patients with immunocompromised diseases.

We propose a drive-through automated carousel system that operates 24/7 solution, that will probably encourage patients who need chronic medications to refill their prescriptions, which will cut down on waiting times. Moreover, this solution enhance communication by automatically detecting over-due refills and electronically generate reminders.

II. Available Knowledge

For patients with chronic illnesses, having access to medication and a steady supply of it is crucial

to preserving their quality of life, improving patient adherence, and lowering healthcare costs [5].

Long wait times for patients were found to be due to multiple causes, such as a high prescription number during times when multiple clinics were operating, a longer processing time when handling prescription errors, and a slower dispensing process when counterchecking filled medications before dispensing.

Several methods have been implemented in other countries to reduce patient waiting time. Some of Which include automated dispensing system, staff scheduling plan, post delivered prescription and redesign of pharmacy workflow [1-4].

In SAUDI ARABIA, one of the methods adopted was implementation of drive through 24/7

automated dispensing carousel system (DAD). DAD was created to ease patients on pickup their chronic prescriptions.

This project aims to evaluate impact of that drive through 24/7 automated dispensing carousel system (DAD) towards patient waiting time at King Salman Military Hospital and to explore the factors associated with patient waiting time when DAD were increased.

Rationale

Long waiting times in KSAFH outpatient pharmacy to collect prescriptions contribute to overcrowding and poor patient experience. The average waiting time is 3.5 hours before implementing drive through 24/7 automated dispensing carousel system (DAD)

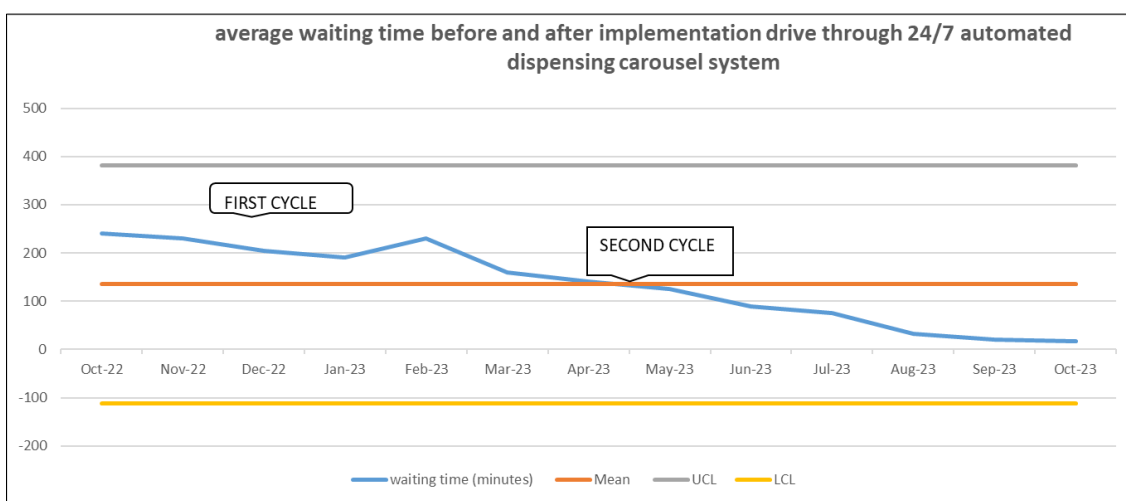
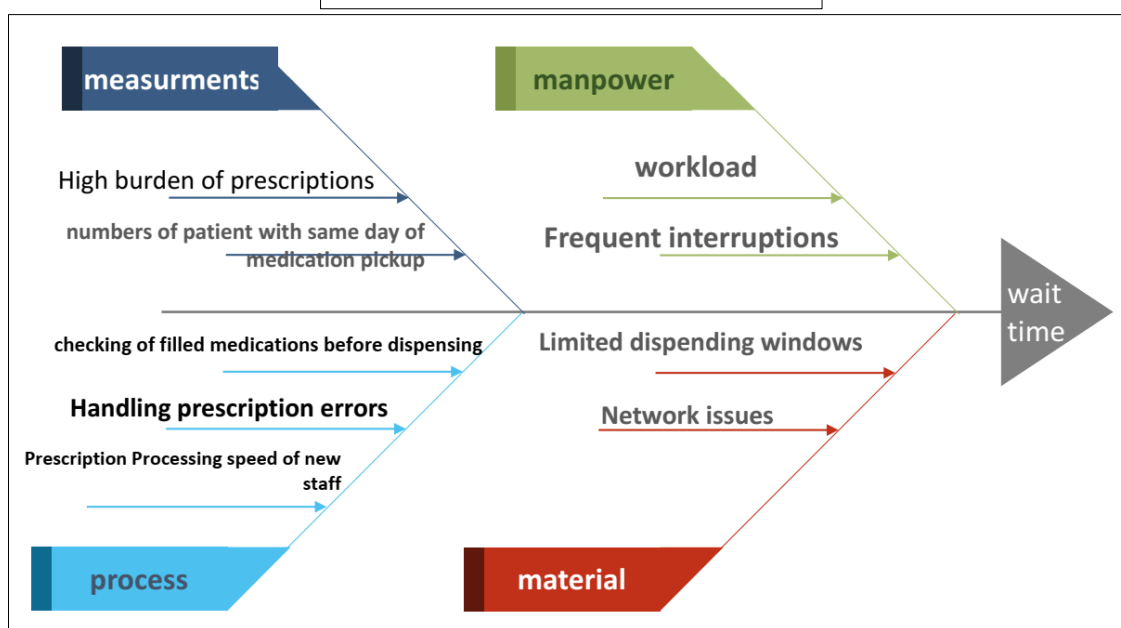


Figure 1

FISHBONE DIAGRAM



III. Specific Aims

Reducing the average waiting time from four hours to sixteen minutes, with a maximum of one hundred and eighty days by October 1, 2023. Enhancing patient experience is our organization goal, and this project will help us achieve it.

METHODS

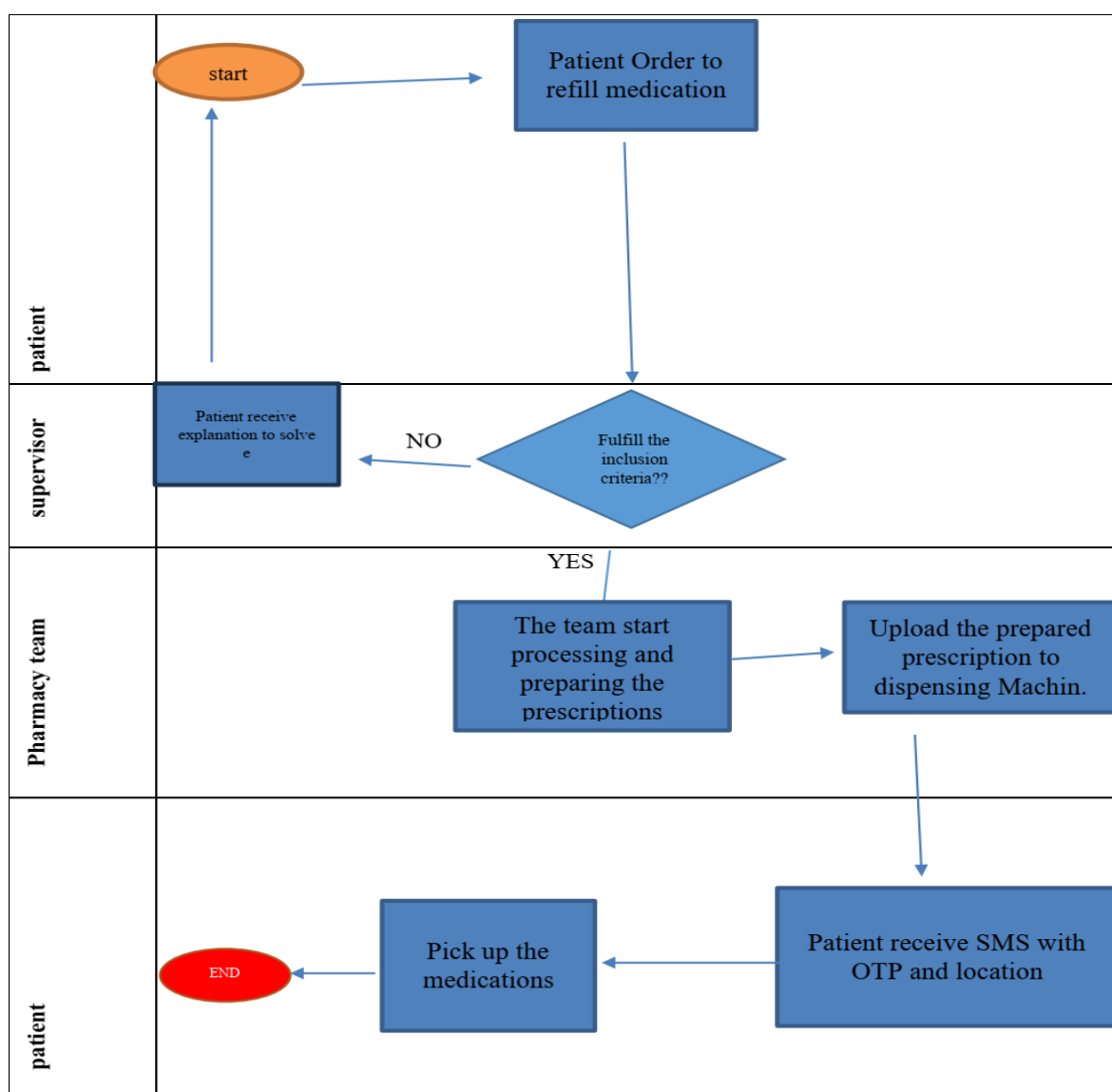
IV. Context

Data will be collected using a standardized form from Sunday through Friday. Baseline data was retrospectively gathered from November 2022 to April 2023 for the pre-intervention phase. There was no active patient knowledge of the use of DAD throughout that time. Nonetheless, it's possible that some pharmacists

unintentionally told the patients that DAD was available at the dispensing counter. To encourage patients to take DAD more often, an awareness campaign was launched in MAY 2023.

The campaign was carried out continuously. In post-intervention phase, impact of increased DAD uptake was evaluated. All prescriptions received during working hours (7am – 5pm, Sunday to Thursday) were included to the study while prescription received after office hour (5pm-7am, weekends), OTC prescriptions, walk-in prescriptions and prescriptions with last supply were excluded.

The Process Map of DAD:



V. Inclusion Criteria

- Patient has an active chronic medication prescription.
- Medications with storage temperature more than 16 degrees Celsius.
- All prescriptions received during working hours (7am – 5pm, Sunday to Thursday).

VI. Exclusion Criteria

- After office hour (5pm-7am, weekends)
- OTC prescriptions.
- Walk-in prescriptions.
- Prescriptions with last supply were excluded.

VII. Intervention (S)

1. Piloting a current practice of traditional methods of dispensing medication. (1st cycle of improvement).
2. Formulate smart pharmacy team with twice weekly meetings to determine the obstacles and area for improvement.

3. Create specific inclusion and exclusion criteria to determine the patient eligibility for DAD service.
4. DAD brochure with website application form for every patient with refill prescription at receiving counter.
5. Active announcement by pharmacist over the dispensing counter.
6. DAD promotional posters and video shows at patient waiting area.
7. SMS text message announcements.

Name	Position	Role
Major OLAYAN ALATAWI	Pharmacy Director	Team leader
Msc.ph NADER ALABALWI	Deputy director	Team member
Dr. TALAL altwigiri	Tele health center director	Team member
Ph. Talal almeghwli	Quality officer	Team member
Faris hakami	Clinical informatics officer	Team member
Eng mansour alatawi	IT deputy director	Team member
Rana albalawi	RN2. head of Patient experience	Team member
Yazeed alkhamesh	Pharmacy technician	Team member
Khalid al atawi	Pharmacy technician	Team member
Ibrahim shajri	Pharmacy technician	Team member
Eyad alalawi	Pharmacy technician	Team member
Ahmad saleh	Pharmacy technician	Team member
Yasser alqahani	Pharmacy technician	Team member

VIII. Study of the Intervention

- A. Average waiting time before and after implementation of drive through 24/7 automated dispensing carousel system was shown in figure 1. The Number of negative

comments received from patient experience about the long waiting time at outpatient pharmacy starting from Q3-2022 to Q3-2023 (figure 2). The monthly prescriptions dispensed through DAD was increased significantly.

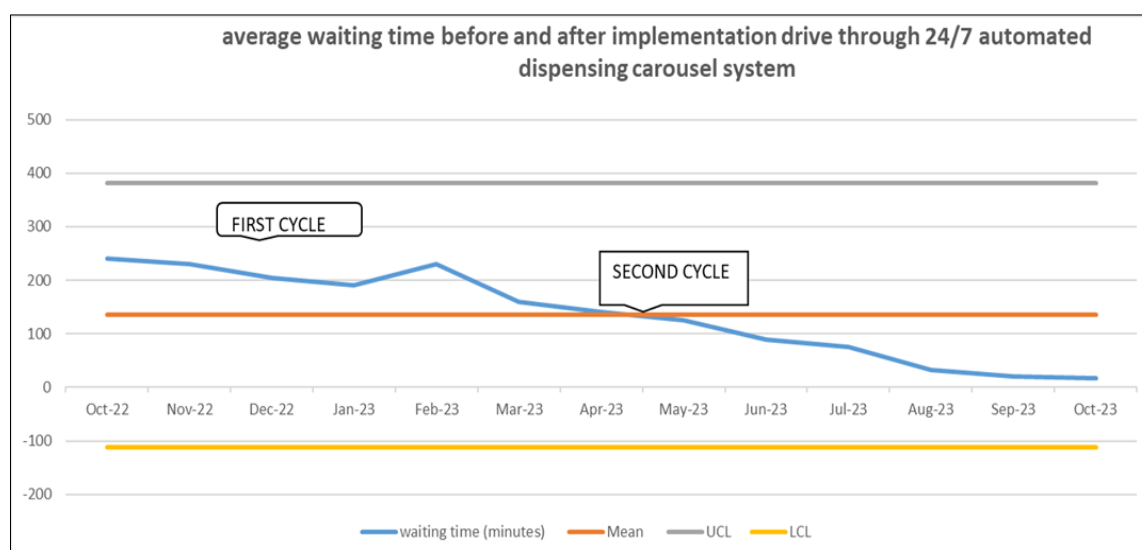


Figure 1: Average waiting time before and after implementation of drive through 24/7 automated dispensing carousel system

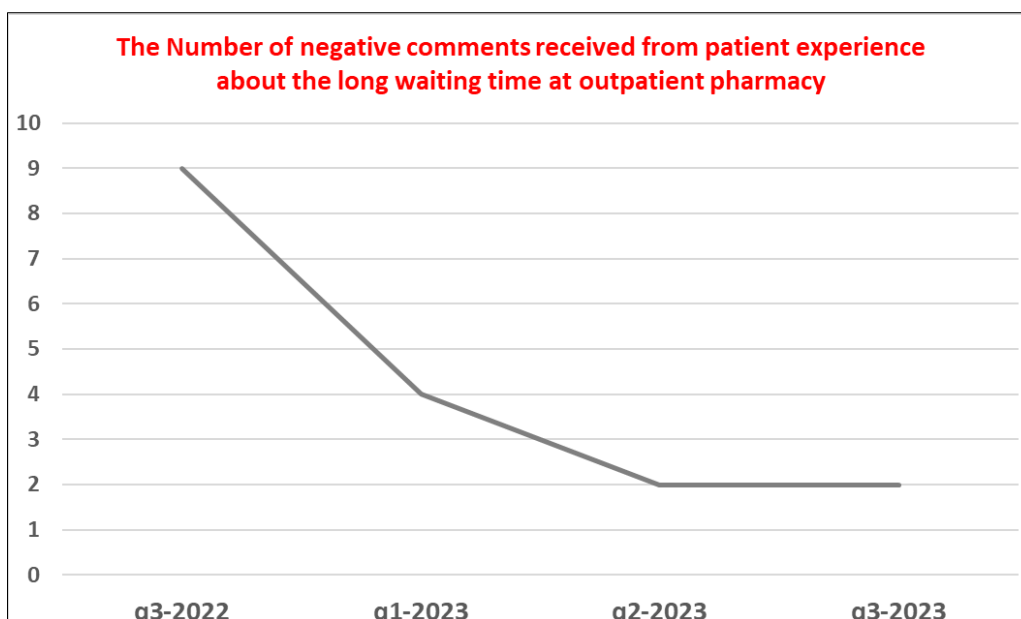


Figure 2: The Number of negative comments received from patient experience about the long waiting time at outpatient pharmacy

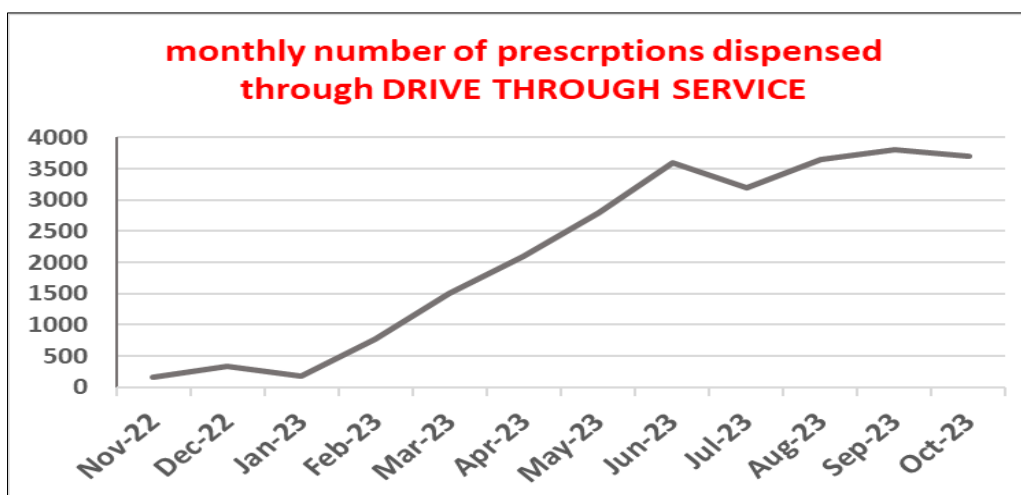


Figure 3: The monthly prescriptions dispensed through DAD

- A. Rapid cycles of data measurement and analysis were done. Data assessment was conducted continuously, twice weekly for the process measures. On a Daily Basis, more patients fulfilled the inclusion criteria for DAD. The pharmacy team will notify a patient via SMS with the DAD location and OTP when the patient meets the criteria for DAD service. This enables the patient to pick up their prescriptions.
- B. Collected Data was validated by using different reviewers and different data sources.

IX. Measures

Two use measures were selected to monitor different steps of the process:

1. Average waiting time before and after implementation of drive through 24/7

automated dispensing carousel system, which is measured in terms of waiting time.

2. The secondary outcome examined the percentage of patients who reported a "negative" experience with their pharmacy care each quarter in a patient satisfaction survey.

Two effectiveness (Outcomes) Measures were selected, to evaluate the impact of the implementation of the new process:

1. The percentage of prescriptions served in less than 16 minutes is used to estimate patient waiting time.
2. All patients rated their pharmacy care as "negative".

X. Analysis

A common cause variation was tracked using the first process measure control chart, and weekly improvements were made in accordance with the findings to keep it under control. The data is depicted in figure 1.

For the second measurement was analyzed using a percentage bar graph depicted in figure 2. Data was collected and analyzed weekly

RESULTS

Over the course of the study period, 240,000 prescriptions (or an average of 900 prescriptions per day) were included for analysis. Of these prescriptions, 15,000 (7%) and 225,000 (93%) were for one-time use and refills, respectively. Of the refill prescriptions, 26.7% of the refills included a request for the DAD service, whereas 73.3% did not.

As compared to pre-intervention phase, the waiting time were significantly lower in post-intervention phase to less than 16 minute, as shown in figure 1.

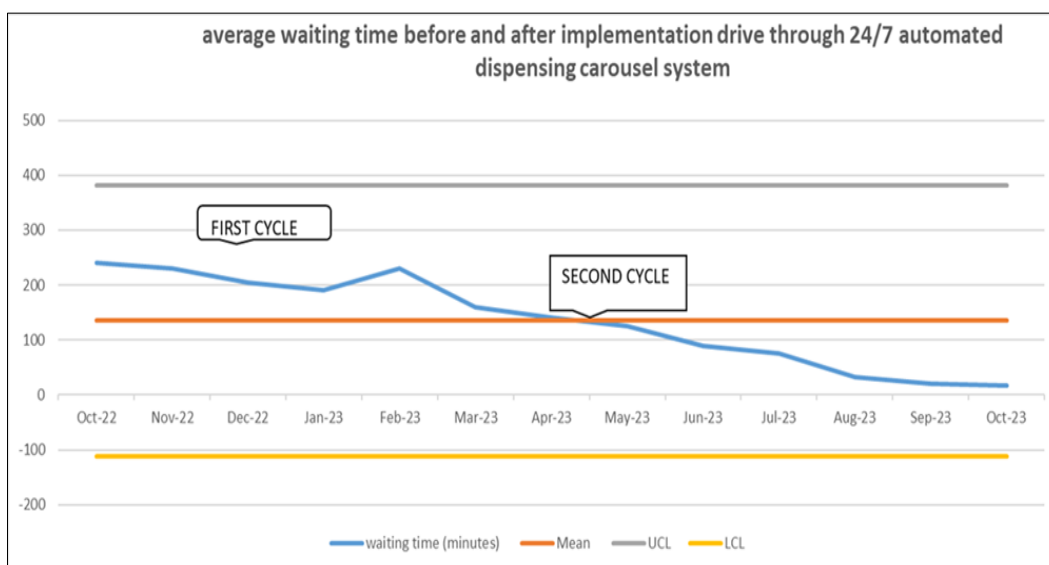


Figure 1

It was determined how much the DAD service affected the quantity of patients who had negative experiences at the pharmacy. Figure 2, and 3 showed that

the DAD uptake was significantly associated with the reduction in number of negative comment.

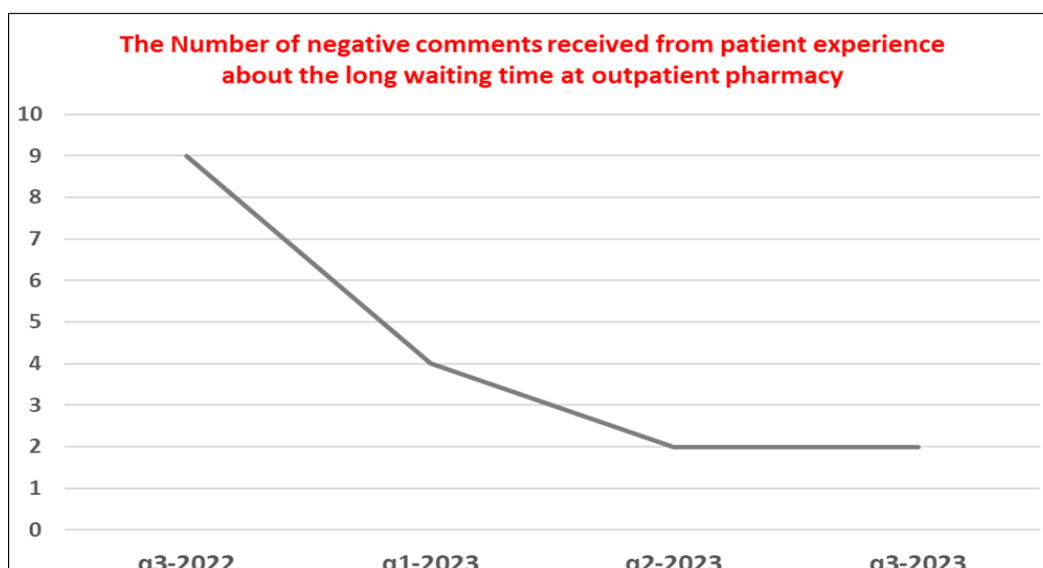


Figure 2

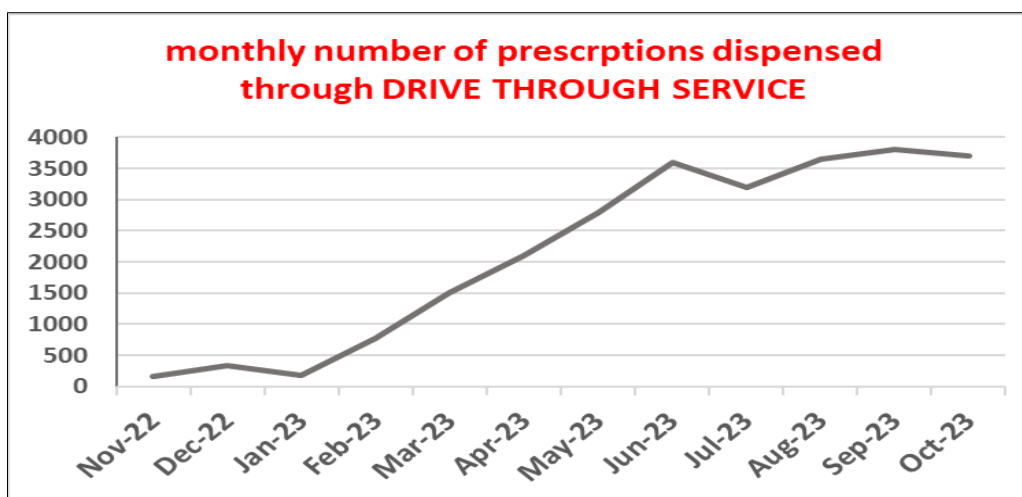


Figure 3

Financial impact of using DAD

The main aim of this service is to reduce the waiting time of patients visiting hospital or healthcare centres to receive their medicines. Unlike many hospitals using Medication Home Delivery Service delivering medications to patients' homes through local post agents such as SMSA, ARAMIX.

In order to enhance patient satisfaction and reduce direct delivery expenses, we created the innovative DAD service. The hospital should be able to use its budget because of this service. Financial impact was shown in table 1.

Table 1:

Financial Impact /300 Prescriptions	Daily	Weekly	Monthly	Annually
Medication Home Delivery Service ARAMIX, SMSA	12000SR	84,000SR	360,000 SR	4,320,000 SR
drive through service	0	0	0	0

DISCUSSIONS

XI. SUMMARY

The purpose of this study was to determine how long patients had to wait to pick up their outpatient chronic prescriptions using a drive-through automated dispensing carousel system that operates 24/7. DAD service requests increased from 160 prescriptions to 3700 prescriptions per month after an active announcement. In the meantime, the average wait time decreased from four hours to sixteen minutes. This study revealed a substantial relationship between the number of pharmacy technicians, pharmacy counters, prescriptions, and repeat prescriptions and patient waiting times.

Within our medical facility. With this service, people can freely refill prescriptions from DAD services that are close to their homes. This is very helpful for our patients, the bulk of whom are from Tabuk City and remote areas.

The purpose of this initiative is to improve patient convenience by clearing up crowded parking spots at busy hospitals. However, one of the bad experiences that the patients mentioned was the Drive Through's Limited number of DAD locations.

The length of time patients spend waiting at the pharmacy has always been taken into account when assessing the quality of pharmaceutical care services offered. As a result, cutting down on wait times has long been a top priority for the hospital. During an interview, supervisors of outpatient pharmacies identified a few potential causes of extended patient wait times. These include a lack of staff, a 30% increase in patients over the course of two years, a rise in prescription errors, and patient counseling. DAD may be able to get around them by limiting the amount of refill prescriptions that come in during busy times. Apart from that, because DAD refill prescriptions can be completed during off-peak hours, it also allows for more flexible workload management.

Failure to solve this problem will compromise patient care and cause overcrowding in the Pharmacy especially during clinic hours.

XII. Interpretation

The average waiting time has decreased from four hours to sixteen minutes as a result of the implemented measures. and enhance the patient experience.

XIII. Limitations

Limitations included, staff productivity and experience, and number of items in prescription were not being studied.

XIV. Ethical Consideration: Ethical approval was not required.

CONCLUSIONS

The implementation of DAD has improved the number of prescriptions served in less than 16 minutes and decreased the average patient waiting time. It was discovered that patient waiting time was correlated with the number of pharmacy technicians, dispensing counters, prescriptions, and refill prescriptions. While DAD is useful in lowering the number of refill prescriptions, more DAD machines are required to detect a practically significant improvement in patient waiting time.

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