An Analysis of Waiting Time Reduction in a Private Hospital in the Middle East

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An Analysis of waiting time reduction in a private Hospital in the Middle East

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Abstract

The study of patient’s waiting time reduction have been receiving attention since the implementation of recent changes in the healthcare quality indicators. However, there is still many areas of improvement the healthcare industry could implement to improve waiting time and positively affect patient satisfaction. This is especially crucial for private healthcare organizations since it has a direct effect on their bottom-line.

In this study, we examine the patient waiting time between the registration stage and the vital sign stage at a private hospital in the Middle East country of United Arab Emirates.

By retrieving the data logs from the EHR system used at the hospital, we can identify the time difference between the logs of each stage. The data then is evaluated and analyzed to calculate the average waiting time at the facility. The process flow of patients is also evaluated to identify possible bottlenecks in the process and recommend changes to alleviate such issues. Then the data logs of the system are take again after the change has been implemented to evaluate the impact of the change on the process.
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Chapter 1

Introduction

Alsharq Hospital is a two year old private hospital in the Emirate of Fujairah in United Arab Emirates. Although two years old, the Hospital is still being built with 35% of its needed specialties are not on board yet. Alsharq Hospital is located in an area where only two other hospitals exist, and being the newest hospital, it has been experiencing high patient traffic; especially during peak hours. Patients are coming to the hospital through appointments and walk-ins, where the majority of the foot traffic is through walk-ins. This is increasing the waiting time for patients between the registration and the Dr. consultation where so many patients are waiting in the lobby of the hospital until they are called to see a the Physician.
A major problem a newly build hospital is facing is the long waiting times that patient have to deal with in order to be seen, which caused patient dissatisfaction for a hospital that is trying to build a good reputation and compete with a government hospital and a twenty year old private hospital. The main lobby of the hospital is usually filled with people waiting to be called and the anxiety of the patients grows higher with the increasing number of the patients waiting.

The waiting time at the hospital has been growing to an average of 40 minutes before the patient could get their Vital Signs taken by the clinic’s nurse. In addition the time for the patient to be examined by the physician has also increased to around 40 minutes between the vital signs and the Physician consult. Although, the wait time for the different clinics varies, the hospital is concerned about the overall waiting time as it is creating a major publicity issue for the hospital.

Background

Alsharq Hospital is a two year old private hospital in the Emirate in Fujairah in United Arab Emirates. Although two years old, the Hospital is still being built with 35% of its needed specialties are not on board yet. Alsharq Hospital is located in an area where
only two other hospitals exist, and being the newest hospital, it has been experiencing increasing patient traffic; especially during peak hours. The hospital operates from 9am to 1pm and 5pm to 9pm, Saturday through Thursday. With Friday being the day off in the Middle East, the hospital only treats cases through the ED on Friday and outside the normal business hours. Patients are coming to the hospital with appointments and walk-ins, where the majority of the foot traffic is through walk-ins.

The issue with the waiting before seeing a dr. is increasing the patient dissatisfaction for a hospital that is trying to build a good reputation and compete with a government hospital and a twenty year old private hospital.

The insurance billing is a rather new thing in the Middle East, where patients need to have health insurance to be treated or they would pay out of pocket, in advance, for the treatment.

The hospital, since private entity, is also concerned about patients leaving before they could see the physician, which causes inability to collect payment for any services rendered to the patient, including registration and Vital Signs.

AlSHarq Hospital is a 100 bed acute care hospital serving the Eastern Province of United Arab Emirates. It is located in the Emirate of Fujairah, which is the only eastern emirate, located on the gulf of Oman. Alsharq is a fairly young Hospital, and it was built as an effort by the emirate governor’s brother (a Sheikh) to help the area with providing more access to healthcare. The area also has one government hospital that has been serving the population of the eastern province. Alsharq Hospital is one of two privately owned, and the newest, hospital in the area; and is thought to become the flagship of
healthcare in the area. The Hospital is owned by a holding company called the Fujairah Health Group (FHG), which is owned by the same people. The FHG also acquired two operational urgent clinics and three pharmacies in the last two years, in an effort to build a wider business model that could serve patients better. The following is the structure of the organization and the hospital management.

Figure 1: Organization Structure

**Purpose of Study**

The purpose of the study is to analyze the workflow for Registration – Vital Signs process, looking for bottlenecks that are causing the increase of the wait time and recommend ways to resolve them to decrease patient wait time, which should have a positive impact on patient satisfaction.

**Significance of Study**
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The study is geared toward the improvement of patient workflow in private hospitals in the Middle East; with the goal of decreasing patient wait time. There hasn’t been a great deal of research in this region that would address patient satisfaction, or lack of, due to prolonged wait time

*Shortening Waiting Times*: Six Principles for Improved Access, one of the six Principals of shortening patient wait time mentioned here is Applying Queuing Theory and Variance Reduction (www.IHI.org, 2011). The hospital currently has a main registration desk located at the front of the hospital that processes all patients regardless of the clinic they are visiting. A large waiting area is available for patients to wait for their names to be called as their clinic’s nurse is available to take them into the clinic area for their vital signs to be taken.

In this approach we will try to split the queue of patients into more than one queue in an effort to reduce the variances in the process followed.

**Research Questions**

- Many of the operation management studies recommend maintaining fewer queues for a process. For instance, at any bank, you will use the same queue if you want to make a deposit, withdrawal, account balance check...etc.

- In the healthcare area, you would always go to the main hospital registration if you are a walk-in patient.

- Could separation and increase, of patient queues in healthcare, have an effect on the overall wait time of the patients in the organization?
In this study we are separating the patient queues for General Surgery clinic, Urology clinic and Orthopedic clinic into a separate queue from the rest of the hospital clinics; which include pediatrics, OBGYN, Ophthalmology, Internal Medicine, Ophthalmology, ENT, Dentistry and Physiotherapy.

**Definition of Terms**

- **Al Sharq Hospital**: A private 100 bed Hospital in the eastern region of UAE serving residence in the Fujairah Emirate.

- **General Manager**: The highest ranking officer in the Hospital. Manages all Clinical and Administrative operations.
Chapter 2

Review of the Literature

1. When I searched for literature regarding the patient waiting time shortening and its relationship to the Patient Satisfaction, I was not able to find many publications about it. The reason may be that private healthcare Organizations information such as this research could be communicating private information about the facility. However, I was able to find the following articles and reports about this area.

2. In 2010, Press Ganey, in the survey *keeping me waiting*, identified the effect of waiting time on the customer satisfaction. This report shows that as the waiting time grows longer, the patient satisfaction drops. In this study the highest waiting time category at 10 minutes or more, which is significantly less than the 40 minutes we are experiencing at AL Sharq Hospital. However, the study also listed recommendations that help in the customer satisfaction rating while patients are waiting.

3. Karen Barrow’s article *The Doctor Can See You Now. Really, Right Now*. Listed the 20 minutes of wait time as the maximum time the patient will wait before they go and check with the reception/registration about the reason they are waiting time is long. It also identified the threshold of the maximum time the patient is willing to wait before they leave the clinic as a maximum of 40 minutes.

4. Lindsey Dunn, *Improving Hospital Operational Efficiency Must Include Patient Flow Improvements*. This article listed recommendation on the steps to hospital operation improvement and it included that the patient flow is a main area that hospitals should be looking at for improvement in their operation.
In 2014, the Institution for Health Improvement (IHI) published a recommendation in the improvement stories section titled ‘Shortening Waiting Times: Six Principles for Improved Access’. In this publication, the IHI listed six areas of process improvement that could be adopted by many health organizations to evaluate and improve their patient service process. One of the recommended approached in this publication is “Applying Queuing Theory and Variance Reduction”. This is an area that proved helpful in the research conducted at Al Sharq Hospital.
Chapter 3

Methodology

Our approach for this study was to collect data from the system logs and evaluate the Patient’s wait time during the outpatient process flow at the hospital. Then the data will be analyzed to get find out where the pain areas are and understand causes of the issue. This was followed by recommendation of process change to improve the patient’s wait time.

Research Design

The design of this research was through evaluation of possible bottle nicks in the process and making a process flow change that improves the throughput of the process in these areas.

Population and Sample Design

We have taken a full month data from the system that consists of a mix of all hospital cases for the month.

Data Collection Procedure

The data was collected through a Hospital System Query designed to give a report of all system logs for the cases in the areas we are studying, yet provide de-identified data for the cases.

Data Collection Instruments

The data was provided by the Hospital IT team through a large excel file that lists all logs for each case. We received the system time log of patients’ flow of all patients that went through the hospital registration system during a full month. The data included case number,
date, time of the day every time the patient had a record update in the areas of Registration, Vital Signs, Physician Consult and Pharmacy check.

Data Analysis

Our initial approach to this study has been through evaluation of the patient’s wait time in three areas:

1- Between Registration and Vital Signs
2- Between Vital Signs and Physician/Doctor consult
3- Between Doctor Consult and Pharmacy

In this evaluation we have taken the system time and date for all logs during a full month in the hospital. Then we evaluated the wait time between each 2 stages. After that we looked for bottle nicks in the process that could be contributing to the wait time. This was followed by a process change. Finally, we took a new reading to see how the change we made had effected the patient’s wait time. However, due to the time constraints on implementing any changes of value within the required time, we opted to only evaluate Patient’s waiting time between Registration and Vital Signs stages.

Representativeness of Sample

Since the data collected was for a full month, it represents all cases types for the hospital. The processes used at this hospital are through to be similar in nature and steps to the majority of the hospitals, especially in the Middle East.
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Profile of Sample or Population

The Sample collected, studied and analyzed will yield reading that shows the Average wait time for each Phase in the process. The analysis also sliced and diced the data to show average waiting time for each day of the week and during peak and non-peak hours.

Research Questions

Could the patient waiting time, in a private health care organization, be reduced by queue splitting the queues?
Chapter 4

Results

Representativeness of Sample

Due to the availability of data in the system and the ease of attaining it, I was able to get the full data of the patients for the whole month without having to resort to sampling. This approach ensured that all the calculation and analysis are conducted on the full population and allowed a full representation of all variances in the attained data.

![Pie chart showing waiting times for patients in November](image)

**November Patients' waiting time before Vital Signs are taken. 3936 Cases**

- 49% Waiting time Less than 20 Min
- 18% Waiting time 20 to 35 Minutes
- 18% Waiting time 35 to 60 minutes
- 15% Waiting time 60 minutes to 10 hours

Profile of Sample/Population

The population of the data included all outpatient cases at Al Sharq hospital during a full month. The data included all the cases of that had gone through the registration process; whither they came through the emergency
department door or through the front door of the facility. All the cases are counted in this evaluation and analyzed.

![Number of cases for each waiting time category – November 2013, 3936 cases](image)

**Reliability of Instrument**

When looking at the reliability of instruments, we find that we were able to account for all the cases from the backend system. As the hospital requires all the cases to be logged into the registration system at the beginning of every case, the margin of error in missing a case should be very slim. This is due to the hospital reporting requirements for the insurance and the government. The EHR system is considered the ultimate source of truth and as the system tracks each login along with the time and department/clinic it came through, it is the most accurate account of the times each case took to moved between the different phases we are studying.
When we Split the registration queue into 2 queues, one for the three identified clinics and the other for the rest of the clinics, we realized an improvement in the processing time of the cases although there was an increase in the number of cases the hospital received during the month of April when compared to November of the previous year.

This shows that although the cases received by the Hospital had increased by 26% in April when compared to November, there has been a throughput increase for the overall capacity of the clinics, where all the categories of the patient waiting time between Registration and Vital Signs had improved.
Limitations

Due to the work nature and the hierarchy structure in the healthcare in the Middle East Hospitals The study experienced few limitations:

1. In this study, I was limited by the data provided by the hospital and there was no way for me, although attempted, to verify the data accuracy. The individuals; including registration and nursing, at the hospital viewed my study as a threat to how they are doing their work. In addition, I was viewed as a big brother who is checking on the work they perform; so information and concerns were not fully communicated by any individuals.

2. All the cases that had missing time data due to improper data entry were eliminated from the calculation of the patient waiting time.

3. All cases that had a wait time of more than 10 hours were considered by management as outliers, and were eliminated from the calculation of the patient waiting time.

4. Acquiring data or information required the General Manager approval every time some data in requested by from the hospital, which prolonged the cycle of information gathering and caused pauses of the work while the project is running.

5. Customer satisfaction data was considered not reliable since the clinic’s nurse is the one who fills the sheet for the patient. The clinic’s nurse also decides which patient received the customer satisfaction evaluation and which one doesn’t.
Chapter 6

Conclusions and Recommendations

This process improvement study looked at shortening the patient waiting time between registration, vital signs, physician exam and pharmacy at a private hospital in the Middle East.

The subject (Al Sharq Hospital) is a new outpatient facility that serves a growing population in an area that lacks the needed access to healthcare. We looked at the system logs of all the cases during the month of November, 2013 to evaluate the length of wait for the patients between Registration and Vital Signs. During the data evaluation we found that the hospital had processed 3936 cases during the month and the average waiting time for each stage was 41 minutes.

The Peak-hours (between 5 and 7 pm) average time was 40 minutes, with 27% of the cases processed during these 2 hours; and the non-peak hours (9am to 9pm except 5-7pm) time was 41 minutes, with 73% of the cases processed during that time.

This indicated that the long wait time is not an issue that is related to number of patients and the demand on the services. When we examined the workflow of patients at the hospital, we found that all the patients, regardless what clinic they are visiting, are going through the same registration area and the waiting area. Patients would wait until they are called to get the Vital signs taken at the clinic they are visiting. When patients are registering it was taking the registration team some time to enter all the information of the patient and their insurance, and then adding them to the perspective queue of the clinic. This had created
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(1) a bottleneck with the data entry and (2) a variance in the different queues a patient could go into. Once the patient is added to the perspective clinic’s queue, She/he will show up in the queue on the perspective clinic; at which time, the nurse will access the patient’s chart on the system before calling the patient into the clinic.

In the attempt to resolve this situation, we created a new registration desk that is close to the General Surgery, Urology and Orthopedic clinic’s block. In addition, we opened an area that wasn’t previously used and designated it as the waiting area for these three clinics.

With this approach, the new registration team would only have to deal with the patients for these perspective clinics and monitor only three queues. In addition, the three clinic’s nurses didn’t have to walk far (to the front of the hospital) to bring in each patient. At the same time, the main hospital registration team had three less queues to worry about.

The Registration queue separation into 2 queues had helped alleviating the two issues where (1) it reduced the patient flow through the main hospital registration and (2) it reduced the variance in the queues for both registration groups.

The change was implemented in March of 2014, and we allowed one month for the process to stabilize. In May of 2014, we took a full data read for all the hospital cases in April to examine the effect of the implemented change.

The data analysis had shows a significant improvement in the patient waiting time during the month of April. The following list shows the improvement during the month of April when compared to November:

1) Number of cases processed: 4977. An increase of 26%
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2) Waiting time of less than 20 Minutes: 2751 Cases. An increase of 42%
3) Waiting time of 20 to 35 Minutes: 894 Cases. An increase of 22%
4) Waiting time of 35 to 60 Minutes: 695 Cases. An increase of 19%
5) Waiting time of 60 minutes to 10 hours: 637 Cases. A decrease of the number of cases in this time by 9%

The following table shows the change in the number of cases between November-2013 and April-2014. Although the number of cases had increased from 3936 in November to 4977 in April, increase of 26% in the demand, the variance column shows that the hospital was able to process 12% more cases below 20 minutes; while dropping the percentage of cases processed in the 20 to 35 minutes, 35 to 60 minutes and 60 minutes to 10 hours by 4%, 6.9% and 39% respectively.

April Patients' waiting time before Vital Signs are taken. 4977 cases

- Waiting time Less than 20 Min: 12.70%
- Waiting time 20 to 35 Minutes: 13.85%
- Waiting time 35 to 60 minutes: 17.82%
- Waiting time 60 minutes to 10 hours: 54.83%
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Waiting time between Registration and Vital Signs

<table>
<thead>
<tr>
<th></th>
<th>Nov-13 cases</th>
<th>Apr-14 Cases</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 20 Minutes</td>
<td>1925 cases</td>
<td>2751 cases</td>
<td>42%</td>
</tr>
<tr>
<td>20 to 35 Minutes</td>
<td>731 cases</td>
<td>894 cases</td>
<td>22%</td>
</tr>
<tr>
<td>35 to 60 Minutes</td>
<td>583 cases</td>
<td>695 cases</td>
<td>19%</td>
</tr>
<tr>
<td>60 minutes to 10 hours</td>
<td>697 cases</td>
<td>637 cases</td>
<td>-9.10%</td>
</tr>
</tbody>
</table>

Table 1: Comparison between Nov-2013 and Apr-2014

From this output we conclude that the queue splitting, and work variance reduction for each queue had contributed to the improvement of the bottleneck at between the registration and vital signs stages, which in turn improved the throughput of the process flow for all outpatient services.
Importance of the results

This results show that in an outpatient healthcare facility, the throughput of the facility would increase with the queue splitting and variance reduction approach to improve the process flow and alleviate bottlenecks. This could also have a significant impact on the patient satisfaction with the services provided when having to wait less time between the different stages at the facility.

Future Study Recommendations

This study was conducted within a very tight timeframe; which imposed a restriction of only studying the time between Registration and Vital Signs. Further studies could be done on the patient’s waiting time between Vital Signs and Doctor Exam and between Doctor Exam and Pharmacy logs for similar type of facilities. In addition, a further study could be completed on the impact of such changes to the process on the profit of the facility or the customer Satisfaction of the patients.

It was noticed that a significant number of the cases have vital signs record, but missing doctor assessment records. This could be due to patients leaving after the vital signs have been taken due to a long wait time. This is an issue that will not only impact customer satisfaction, but also will have a negative effect on the financial bottom line of the hospital.
Bibliography


