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Delays of Covid-19 Swab Tests and Covid-19 Laboratory Reports by Private Healthcare Institutions in Shah Alam, Selangor, Malaysia

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ABSTRACT
In Malaysia, during the COVID-19 pandemic, the Majlis Keselamatan Negara (MKN) through the Kementerian Kesihatan Malaysia (KKM) sanctioned private medical centres to provide swab test services to the public to avoid over-burdening government hospitals and public clinics. Initiatives by private hospitals and clinics in Shah Alam, Malaysia, include Walk-in and Drive-through at their Emergency Departments. However, there are several nagging issues as regards their services. This study investigates the level of services rendered and the satisfaction levels as expressed by the public via online surveys. Interviews provide information pertaining issues faced by the service providers. Consequently, three main findings are identified namely delays during swab tests, delays for patients to receive their COVID-19 lab results and moderate patients' satisfaction for the services during the swab tests. Henceforth, this study proposes four crucial measures to overcome those shortcomings. This includes firstly, reducing the waiting time via online appointment before swab tests. Secondly, is setting up more swab test stations. Thirdly, beefing up the essential healthcare professionals and institutional permanent assets and lastly, instigating private healthcare institutions to improve their service quality for the COVID-19 swab test process by introducing interesting servicescape elements around the health centres and benchmarking with other medical centres to stay competitive.

Keywords: COVID-19, Majlis Keselamatan Negara (MKN), Kementerian Kesihatan Malaysia (KKM) swab tests, delays, Servicescape, benchmarking.

1. INTRODUCTION

Many private healthcare institutions and laboratories (labs) responded promptly to the government's call for help in providing COVID-19 swab tests during the second wave of the COVID-19 outbreak in Malaysia i.e. at the end of March 2020. The Kementerian Kesihatan Malaysia's capacity had been exceeded due to the enormous amount of samples and patients seeking confirmation diagnosis and extra samples had to be sent to satellite labs. However, ever since KKM allowed swab tests to be done by private healthcare institutions, the government's burden had been lightened but there were numerous complaints emerging from both patients and service providers. Patients' complaints were especially concerning delays in getting the swab tests and in receiving lab reports. Generally, the turnaround time for Antigen Rapid Test Kit (RTK-Ag) is between 15 minutes to 20 minutes and for Polymerase Chain Reaction Test (popularly referred to as RT-PCR), it is between 24 hours to 72 hours (National COVID-19 Testing Strategy, 2021). But, delays persisted at these two stages. According to a Medical Officer, a complete test process, whether Walk-in at the Emergency Department or Drive-through, normally takes about 10 to 15 minutes per person i.e. from the registration until the swab test is done. For Drive-through, when there are too many vehicles

queuing to do the tests and when one vehicle carries more than one passenger, the waiting time will naturally be longer. Since there is only one station for the swab test, bottlenecks normally occur at the station. Situation becomes worse when patients insist to do the swab tests even during heavy rain.

Another problem identified is about delays in receiving COVID-19 lab results. All swab samples are handled by private labs, either at the medical centres or corporate private labs. There are two different tests offered namely RT-PCR and RTK-Antigen at different prices. The method of RT-PCR is complex and the minimum hours to run the sample is 4 hours while RTK-Antigen only takes 10 minutes. The issue is that samples can only be collected at swab test station four times daily i.e. at 12.00pm, 5.00pm, 7.00pm and 9.00pm. The RT-PCR samples received after 7.00pm and 9.00pm will have to be carried forward to the next day and will only be run at 5.00pm. This does not meet patients' needs. Many patients insist that they need the results urgently for purposes of travelling, hospital admission and interstate movements.

Another critical issue is the life of the results. Validity of COVID-19 lab reports only last for 3 days. If the lab result is inconclusive, the Medical Lab Technologist needs to run the sample again the next day. Thus, it will delay the lab result to be released to the patient. Patients are also at fault because according to the Medical Staff Records many patients came to do the swab tests at the last minutes before their flight. If the result is inconclusive, it will surely delay their time to be at the airport to catch their flight. Of course, patients were dissatisfied due to the late release of the result. It is common knowledge that the duration for swab test result will be released within 36 hours for RT-PCR and 24 hours for RTK-Antigen, but inconsiderate patients still ignore this fact and blame the service provider instead for late lab report.

From the online survey, it is found that customer satisfaction is moderate. Most of the respondents who opted for the walk-in service were moderately satisfied. They thought that they could get better service from other Medical Centres. Likewise, respondents who did the swab tests by drive-through also rated their satisfaction level as Moderate. Respondents were not satisfied with the services given due to the long wait and long queue at the swab tests area. They argued that if they were to go to another drive-through swab tests of other private clinics they would not encounter this problem. They complained that they did not have other option to go to other medical centre simply because their company had pre-determined it.

2. LITERATURE REVIEW

The procedure for detecting COVID-19 virus is rather new (Centers for Disease Control and Prevention, 2020). The molecular PCR test, which can be categorised as a diagnostic test, utilizes nasal swabs and gathers cells and liquids from the human respiratory system. It empowers the recognizable proof of explicit qualities for the SARS-CoV-2 infection that causes COVID-19 (Medlineplus, 2021). The sample is gathered utilizing a long nasal swab that is embedded between the nose and the rear of the throat. PCR test is 100 per cent exact but the time needed for the lab to retrieve the result is longer than the RTK test. Rapid antigen tests represent the greater part of the quick demonstrative tests. The purpose of the nasal or throat swab is to search for the protein content responsible for the COVID-19 infection. Antigen tests are more affordable and a speedier time is required to circle back, sometimes only 15 minutes. Notwithstanding, they are less precise since where an individual is not close to the contamination, yet infectious, the tests might return negative. This is the reason why the Centre for Disease Control and Prevention (CDC) exhorts individuals who show COVID-19 side effects but tested negative with the antigen test to get the PCR test to affirm results. An immune response test, otherwise called a serology test is completed with a blood test that might recognize past disease of the infection that causes COVID-19. A test search for proof of the body's invulnerable reaction to the infection is required. Antibodies are identified in the blood after contamination. Notwithstanding, with COVID-19, complete antibodies have yet to be established (UC Davis Health, 2021).

Since the permission for private medical care organizations to conduct swab tests for the public, there were numerous complaints received by the KKM. The main grouses were delays in getting the swab tests and in getting the results. In other words, services rendered by private health institutions were regarded by the public as not up to the mark. Recent research has shown that service time is a key challenge to service quality, profitability and productivity (von Schéele et al. 2019). In such circumstances, delays will generally accumulate and impact one another. Therefore, a postponement will create setbacks for another occasion impacting the level of customer satisfaction. Hence, this study attempts to address two research questions namely to identify the causes of delays in conducting swab tests and the delays in producing results by private labs in Malaysia. Findings of this study will provide service providers in the private healthcare institution to understand and predict the service delays, control them and then increase the quality and productivity of service operations specifically through the walk-in and the drive-through service. Finally, this study will offer solutions to surmount the problems. This will in turn help KKM to speed up swab test services and fight the COVID-19 pandemic for the nation as a whole.

3. METHODOLOGY

In order to identify the service problem of swab tests by private healthcare institution, a semi-structural interview had been conducted with medical officer in-charge, Staff Nurse and Finance Officer of several private healthcare institutions in Shah Alam, Malaysia. For Customer Satisfaction level a simple online survey had also been conducted for two days involving patients as the respondents. A Google form link was given to 18 patients who attended swab tests on 20 December 2021 and 21 December 2021.

4. FINDINGS AND DISCUSSION

Figure 1 illustrates a typical process involved during swab tests at the Private Healthcare Institutions.

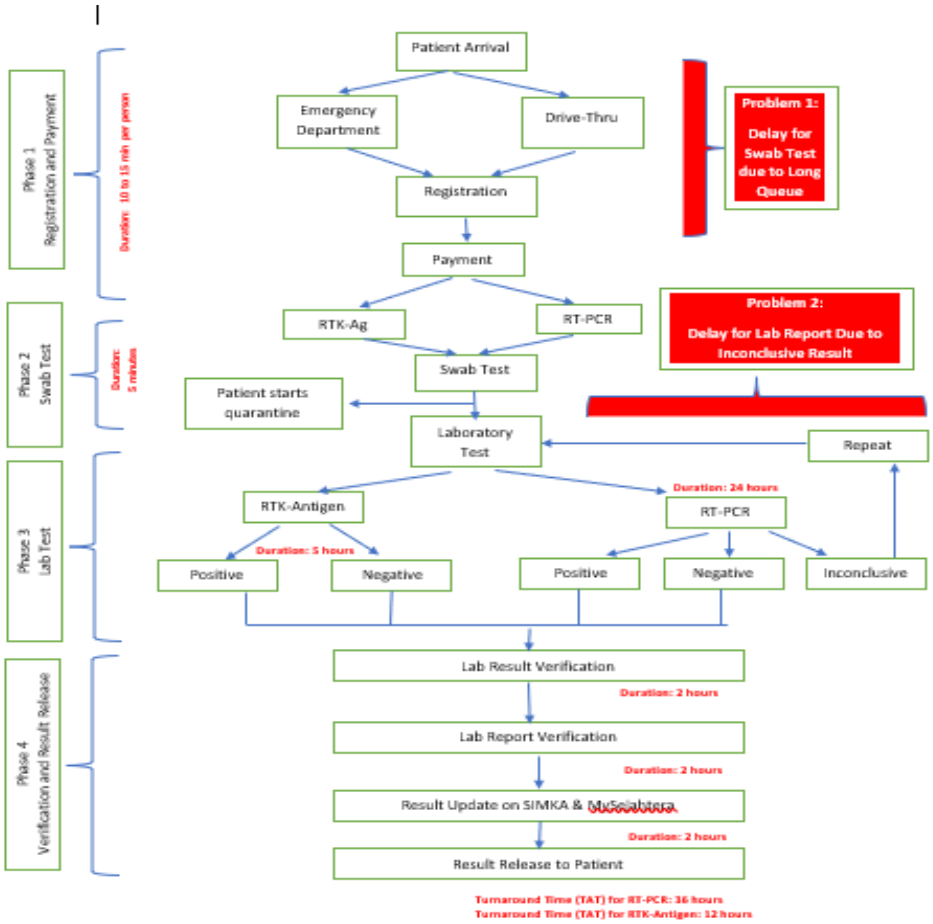

Figure 1: Common COVID-19 Swab Process Mapping in Private Healthcare Institution

The following are responses and information received from the interview sessions conducted with the healthcare professionals and Medical Laboratory Technologists. Basically, there are three main problems highlighted by them and after being analyzed certain solutions are suggested by this study as follows:

Problem I: Delay to do swab tests

The process of swab tests started from the arrival of patients to the medical centres or clinics, either Walk-in at the Emergency Department or Drive-thru. From the interview sessions, few factors were thought to have contributed to the delay as follows:

Healthcare Manpower Shortage

Abiding the protocol set by Kementerian Kesihatan Malaysia, the swab test station and the "swabber" must be a Medical Officer and assisted by healthcare professionals such as Staff Nurse and Medical Assistant. For the registration, staff from the medical record department will be located in the swab test station, as well as staff from the Finance Department for payment purposes. Therefore, at the swab station there must be at least 5 staff to accommodate the swab test per shift. As disclosed by the Medical Officer during the interview session, the Medical Officers and other healthcare professionals will be taken from the wards and specialist clinics. It is said that many medical centres or clinics are already currently having shortage of manpower. In fact, there is no specific medical officer and healthcare specialists being allocated specifically at the swab test station. As these medical officers and other healthcare professionals are in-charge of their primary station, they need to divide their time to cover the swab test station as well.

(i) Long Queues

Another factor that causes delays when doing the swab test is the long queue for the walk-in and the drive-through. Normally, the duration from registration until payment takes about 10 to 15 minutes per person. Bottleneck happened where patients did not give full details during registration or payment for the swab test was put on hold due to their card status or cash payment problems. The long queue also happened when one vehicle had more than one passenger. This usually happen when an area is affected with COVID-19, making the whole office and their family to come to the medical centres or clinics to do swab tests at the same time. When infection has been detected in factories or supermarkets, patients will come by the bus loads! Since at the swab test station only one Medical Officer, two healthcare professionals, one registration staff and one finance staff are on duty, it will take ages to attend to all the patients. All of the patients have no choice but to go to places as instructed by their management.

(ii) Bad weather

Another factor that contributes to the long queue is bad weather during the swab test. Currently, the swab test station for drive-through does not have a roof top. Many patients hesitate to go inside into the Emergency Department for walk-in. They insist to do the swab tests from their vehicles. As a result, the healthcare professionals need to cover themselves with umbrella which cause difficulty to do the registration and the finance staff also find it difficult to conduct the payment process during rain.

Problem II: Delay for the patient to receive their COVID-19 lab result

Another problem identified from the interview is the delay for patients to receive their COVID-19 lab results. This is caused by related factors like:

(i) Inconclusive Results

Inconclusive result is when the sample result is neither positive nor negative. Therefore, the same sample needs to be run again the next day. As a result, the lab report for that patient will be extended to more than 36 hours. Usual duration only takes a minimum of 5 to 12 hours, depending on the type of PCR machine and type of test chosen by the patient. Another factor that contributed to the inconclusive result is that the criteria of the sample received were not good. To run a reliable test, samples with the following criteria will be rejected. They are as follows:

- No sample identity on patient's request form or incompletely filled form
- Sample without patient's request form
- Sample with no label
- Sample identity on patient's request form and sample label did not match
- Test requested on patient's request form and sample did not match
- Broken or leaking container or split sample
- Unsuitable test sample i.e. sample sent in improper container

(ii) Overloaded Samples

Another causal factor that contributes to the delay is overloaded sample. One PCR machine can only accommodate 96 samples at one time. When the Movement Control Order (MCO) was imposed, there were too many samples received from the Emergency Department,

Drive-Through and also samples collected from factory sites. When samples received were more than 96 samples at one time, the Medical Lab Technologists had to run the sample test process more than once. This will definitely delay the turnaround time for the process of lab tests to be completed.

(iii) Shortage of Qualified Medical Laboratory Technologists

Shortage of manpower also contributed to the delays. Not all Medical Laboratory Technologists (MLT) or Science Officers can run the PCR test. It is based on certain skills and qualification to handle the machines. The PCR machine is really sensitive to the environment and also to the samples. Due to manpower shortage, the test cannot be done on the same day if the samples received are more than 96 samples. The balance of the samples will be carried forward to the next day and will be run at 5.00pm. Thus, it will delay the sample testing process.

Problem III: Moderate Patients' Satisfaction of the Swab Test Services

An outstanding finding from the online survey is that most of the walk-in patients rated the service given only as moderate. Drive-through patients also gave feedbacks as not up to their expectations. In other words, they were not satisfied.

Overall, healthcare service is a patient-oriented service that requires continuous interaction with customers. It utilizes facilities and equipment, and requires tip top nursing care. Therefore, to attain high Customer Satisfaction, it becomes increasingly important to healthcare executives to understand what kind of facility, equipment, and workforce decisions are critical to achieve the commonly acknowledged goal of providing quality health service and at a reasonable cost (Li et al., 2002).

Solution I: Reducing the Waiting Time

Efforts are needed to address the problem of long waiting time. Crowding in Emergency Department results in long waiting times and can eventually result in patients Leaving Without Being Seen (LWBS) by the doctor (Daultani et al., 2015). A good service operation management is very much a preferred solution to overcome these conditions as it is able to reduce wasting time. Professional healthcare services should improve issues of appointment scheduling, demand smoothening and overbooking Standardization is frequently a good element of service operation management, but this option should ensure patient safety. Several benefits like turnaround time reduction, medical errors reduction, system efficiency improvement and patient satisfaction improvement can be achieved in healthcare services when the management institute patient-friendly Standard Operation Procedures (SOP).

Hence, to overcome the delay issues, this study proposes new SOPs to be adopted by Private Hospitals and Clinics in Shah Alam. They are as follows:

(i) Online Appointment Before Swab Tests

Many private healthcare institutions have their own websites that can interact with their potential customers. It is highly recommended that private healthcare institutions upgrade their websites to be more interactive via establishing online appointment system before customers come for swab tests. Customers can fill up their own information, medical history and can pay the cost of swab test even before they come to the clinic or medical centre. Thus, it will save time for the registration and payment process therefore reducing the waiting duration.

According to Cao et al. (2011), in China the lengthy waiting time for registration at tertiary

medical centres to see a doctor is also a pressing issue. To overcome it, Xijing Hospital has created a web-based appointment system to solve this problem. The researchers of that study wanted to see how successful the web-based appointment system was in outpatient registration services. According to the findings of that research, the web-based appointment system had greatly improved patients' satisfactions for registration while also reducing waiting time. However, the system has still to be improved before it can be widely applied.

(ii) Set more Swab Test Stations, increase essential Healthcare Professionals and add Permanent Assets

Instead of crowding at the current swab test station, private healthcare institutions should add more swab test stations. To avoid congestion every station must have different entrance and exit. The queuing system must be implemented as to avoid rush and provide comfort to customers. The implementation of Lean Thinking is really useful especially in healthcare institution. Lean thinking emphasises things that bring value to customers and the health institutions as a whole. The goal is to guarantee that customers, or actions done on their behalf, move through the system as rapidly as possible, with little wasted time, lowering costs and boosting customer satisfaction. The volume of work and degree of interaction, as well as adaptation for diverse healthcare facilities influence management concerns. In the case of services with low labour intensity, the choice of technology and medical equipment is crucial. The utilisation of equipment and the time it takes for patients to go through the hospital are important issues to consider (Daultani et al., 2016). Equipment usage may decrease if proper demand management strategies are not available. In high labour-intensive healthcare services such as Swab Stations, manpower recruitment, training, and scheduling become crucial. Skilled staff is required to handle the public and COVID-19 potential patients. Human resource management should reward them accordingly.

Solution II: Recommendation to increase the service quality in the COVID-19 Swab Test Process

(i) Applying the Servicescape Elements

To increase patients' tolerance especially while waiting at the Emergency Department, servicescape elements should be improved. Servicescape is often linked with overall environment that exudes purity, tranquility, cleanliness, and a sterile environment in hospitals and medical institutes. In any hospital emergency room, long wait times are well known. Therefore, client behaviour is often influenced by a good Servicescape and a network of Medical Centre services such as convenient parking, Emergency Department entry layout, spacious sitting arrangement in swab test areas and friendly personnel treatment.

Lai and Chong's (2019) research entitled "Are Public and Private Hospital Services Different?" contradicts the finding from DCunha et al. (2019) where they found no significant variations in view of design and social features, as well as the quality of the overall Servicescape between outpatients and inpatients. Patients appreciate the many aesthetic characteristics of Servicescape and how they impacted hospital environment in Malaysia. Generally, private hospital setting provides a larger range of lighting and acoustics creating more comfortable and stress-free atmosphere for patients. Several researches have shown that this trait is crucial (Ceiling and Interior System Construction Association, 2010; Sahoo and Ghosh, 2016). Hospital lighting also demonstrates that it is capable of providing modern medical technologies (Nazem and Mohamed, 2015). Private

hospitals, according to Moghavvemi et al., have better surgical equipment and therapeutic facilities than state hospitals (2017). Hospital lighting also demonstrates that it is capable of manufacturing less expensive medical equipment (Nazem and Mohamed, 2015). Private hospitals, according to Moghavvemi et al., have better surgical equipment and therapeutic facilities than state hospitals (2017). The findings show that public hospitals should adopt predictive maintenance of hospital facilities since building and facility maintenance is often linked to the efficiency and appropriateness of health care services.

A good servicescape not only provides convenient service but create interesting ambience and comfort. Patients will get confused and restless if they are surrounded by strange designs. While it is hard to repair or construct a facility when it is surrounded by buildings with no "extra" accessible paths, management may provide patients with additional amenities such as trolley rides between entrances and exits.

Usually, private hospitals are free to introduce “state of the art” interior designs, décor, and architecture. Patients recognize that private health institutions are generally modern, forward-thinking and market-driven. Creating a physical environment that fosters quick recovery treatment and rehabilitation is obviously important to private hospitals (Suess and Mody, 2017). While interior design has the lofty goal of creating a better environment for illness treatment, these factors have the greatest impact on private hospital services. Private hospitals normally strive to create an atmosphere that improves patients’ experience and facilitates their treatment. Private hospitals or clinics do not solely emphasise on the efficiency of physicians, personnel, and medical equipment, to obtain market share (Senic and Marinkovic, 2013) but try their best to gain reputation in terms of good servicescape.

(ii) Benchmarking With Other Medical Centres

Benchmarking is an integral aspect of every healthcare organization's operational strategy. Benchmarking is the process of defining standards of excellence and comparing a business, product or organizational operations or activities to those standards. Benchmarks will be increasingly used by healthcare organisations to save costs while enhancing the quality of their services (Benson, 1994). Benchmarking is a continuous process in which a healthcare organization measures and compares its own processes to those of the industry leaders. It is a component of overall quality assurance (Benson, 1994).

Benchmarking should be seen as a healthy attempt to improve the management system and procedures. In healthcare, benchmarking is used to enhance efficiency, treatment quality, patient safety, and satisfaction (Lagasse, n.d.). Competitor benchmarking partners operate in the same market and give direct product or service comparisons (Benson, 1994). In order to achieve this objective, the benchmarking has to be done amongst the same types of healthcare institutions, namely medical centres that have their own in-house laboratories can run COVID-19 samples testing. The In-House laboratory also must be equipped with the PCR machine, RTK kits, test method and scope of tests must be registered for MS ISO 15189:2014 (Medical Laboratories – Requirement for Quality and Competence) and Skim Akreditasi Makmal Malaysia (SAMM). As a result, the benchmarking process will be more relevant, particularly in terms of service quality.

5. CONCLUSION

The introduction of Swab Test Drive-Through and Walk-In by private hospitals and clinics in Malaysia offers patients to get their COVID-19 swab tests in the most convenient and fast manner possible. In addition, the laboratory's initiatives to run COVID-19 samples 24 hours a day also provides the finest customer experience for patients. From the time the patient arrives at the private healthcare institutions until the test results are released to them, it could be seen that all healthcare professionals make every effort to deliver their finest services

possible. The role of private healthcare institutions in helping the government to fight COVID-19 is considered equally important. Patients' positive experiences from these centres will definitely increase their confidence in getting treatments at private institutions in the future.

Nonetheless, this study identified three outstanding setbacks to be overcome by private health institutions. They are delays in swab tests, delays in patients receiving their COVID-19 lab results, and moderate level of patients' satisfaction for service during swab tests. This study proposes three solutions to address those issues. Firstly, in order to reduce waiting times online appointments prior swab tests are to be practiced. Secondly, more swab test stations are to be set up. Lastly, essential healthcare professionals are to be increased and additional permanent assets need to be provided. Other recommendations by this study are to offer ways to enhance service quality in the COVID-19 swab test process by improving the servicescape aspects and to practice healthy benchmarking against other medical centres. The latter is a crucial part of a continuous service quality improvement process.

Generally, other healthcare providers offer competitive services and render add-on services to get the competitive edge. Thus, target of the service operation management is to guarantee patient memorable experience especially while receiving the swab test. Private healthcare institutions and their laboratories must improve present practice by meeting patients' expectations and negate their poor perceptions. By reducing waiting times and eliminating delays in swab test and lab result delivery, private healthcare institutions and laboratories can improve the customer experience and gain a competitive advantage. Additionally, private healthcare institutions should enhance customer experiences in the Emergency Department by introducing the finest servicescape. Private healthcare institutions and their laboratories should also benchmark their services in order to improve and compare existing practices and finally in order to excel as the market leader in healthcare.

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