COVID-19 IN MALAYSIA

Facing COVID-19 in Malaysia: A Medical Frontline Experience

Sarah Aliah Mohd Azman

ABSTRACT

Introduction: The Coronavirus Disease (COVID-19) is a rapidly spreading viral disease alerted by the World Health Organization (WHO) as a Global Pandemic which has resulted in panic around the world. COVID-19 spreads through 'human-to-human' transmission in forms of close contact. The spread of the disease has affected most countries, including Malaysia. A brief chronological event provides an understanding of the first encounter of this pandemic into Malaysia. An extensive report on the enforcement protocol by the Government of Malaysia and Ministry of Health is shared in this article. University Malaya Medical Centre (UMMC) being the lead university hospital in Malaysia, documents its frontline experience.

Objective: Thus, the aims of this article are to report incidence and demographic data of COVID-19 in Malaysia and secondly, to highlight measures taken in managing patients in a university hospital set up; University Malaya Medical Centre (UMMC).

KEY WORDS
COVID-19, Movement Control Order (MCO) or lockdown and University Malaya Medical Centre (UMMC).

INTRODUCTION AND AIMS

The local media reports the rapid rate of spread of the Coronavirus Disease (COVID-19) with a record of 1,272,901 cases in 10 most affected countries worldwide\(^1\). These countries include United States of America (336,673), followed by Spain (131,646), Italy (128,918), Germany (100,123), France (92,839), China (81,706), Iran (58,226), United Kingdom (47,806), Turkey (27,069) and Switzerland (21,100)\(^2\). Malaysian data currently reports a total number of 3793 cases, 2490 undergoing treatment, 1241 discharged, 62 confirmed deaths as of 5th of April 2020\(^2\).

The aims of this article are two folds: First, to report the occurrence of COVID-19 in chronology leading to its first entry in Malaysia and secondly, to highlight general measures taken by the Malaysian Government, Ministry of Health (MOH). Additional focus is given on the management of COVID-19 patients in a university hospital set up, University Malaya Medical Centre; UMMC. This effort is intended for mutual sharing of demographic and patient data, protocol, procedures as well as initiatives adopted by the medical front liners of UMMC designated to this challenging task.

Brief Chronology of Events

31st of December 2019 - Health Authorities in China had alerted the World Health Organization (WHO) of a cluster of incidents involving lung 'disease-like-pneumonia' with an unknown source of infection in a community in Wuhan, China.

5th of January 2020 - Health Authorities of China confirmed that the disease was not 'influenza' 'avian flu', 'adenovirus', 'Middle East Respiratory Syndrome (MERSCOV) or 'Severe Acute Respiratory Syndrome (SARS)'. It was a disease of unknown source.

12th of January 2020 - The first case was reported in South East Asia. Thailand was the first country to have reported a case of COVID-19 which affected a female individual from Wuhan with symptoms of fever and pneumonia.

16th of January 2020 - In Malaysia, the Ministry of Health (MOH) alerted Malaysians and were advised for preventive and preparatory steps in managing COVID-19.

Ministry of Health (MOH) Malaysia: Preventive and Preparatory Steps

Measures were implemented as follows:

i. All Health Authorities under the Malaysian Ministry of Health (MOH) including personnel at the Malaysian Borders were informed regarding the viral pandemic and steps of prevention and disease control.

ii. Strengthening of the system of examination by the Malaysian customs among tourists and Malaysian citizens traveling from abroad was performed prior to entering the borders of the country.

iii. Tourists or Malaysian Citizens traveling from abroad, if screened to have symptoms of COVID-19 are quarantined at the Health Quarantine Centre or at the examination centers at the Malaysian Borders.

iv. Examination of patients at the Government clinics and Emergency Departments of government hospitals are conducted on suspected cases and are ensured to follow steps of precaution and disease control.

v. Patients with symptoms of COVID-19 and acute respiratory distress symptoms within 14 days of traveling from Wuhan, China are advised to be screened and examined at the nearest hospital for evaluation.
health facility. vi. Suspected cases of COVID-19 are to be notified and reported to the District Health Office, State Health Department and the Crisis Preparedness and Response Centre (CPRC) of MOH. vii. Screening and confirmatory tests are conducted at the Institute for Medical Research (IMR) and the National Public Health Laboratory. viii. MOH personnel are advised to use personal protective equipment (PPE) and stockpile for PPE and medications in managing the viral infection at our respective facilities. ix. MOH conducts efforts with all agencies in ensuring activities of preparedness and response in an event the viral infection spreads in Malaysia.

Despite preventive measures, the spread of the virus was rapid. Ministry of Health Malaysia (MOH) reinforced the preventive and disease control measures and identified 26 government hospitals to be the Centre of COVID-19 patient management. A rapid response team (RRT) and Rapid Assessment Tool (RAT) were activated to screen confirmed or suspected cases of COVID-19 from the government hospitals. 22nd of January 2020 - The first meeting session of the International Health Regulations (IHR) Emergency Committee was conducted to discuss COVID-19 being a Public Health Emergency of International Concern (PHEIC).

The Malaysian government and MOH advised the public to postpone trips to Wuhan, China in the midst of worsening spread of disease. Extra measures were advised to the public:

i. Practice of good personal hygiene and frequent hand washing / hand sanitizing
   ii. Practice the use of face masks
   iii. Avoid visiting crowded places and avoid close contact with the public
   iv. Avoid visiting animal plantations, dry and wet markets, places of animal slaughter or close contact with animals
   v. Avoid eating raw meat
   vi. To get immediate treatment if the individual develops fever, cough or shortness of breath within 14 days of visiting Wuhan, China and to inform health personnel regarding recent travel.

COVID - 19: Malaysia’s first encounter

25th of January 2020 — Malaysia’s first encounter with a COVID-19 positive individual was in Johor, a state, south of Malaysia. The individual was a 40-year old gentleman from Wuhan, China who arrived in Johor Bahru with 17 other tourists (close contacts) in a bus. He developed respiratory symptoms and received treatment at a private hospital under the Medical Team of Infectious Disease in Sultanah Aminah Hospital, Johor Bahru. The screening and confirmatory tests were sent to IMR. CPRC was notified of the results reported to be confirmed positive for COVID-19. Contact tracing was conducted to all 17 close contacts (Table 1) and were quarantined accordingly.

The Malaysian government and MOH further reinforced preventive measures to postpone trips to Wuhan, China to curb the worsening spread of disease. In addition to that, the number of 'Person Under Investigation' (PUI) in the month of January 2020 had slowly increased to 65 cases with 34 cases being Malaysian citizens, 30 citizens of China and 1 individual from Jordan. From the 65 cases, only 1 person was tested positive for COVID-19. 3 had close contacts, pending results (as of the date shown) and was later confirmed to be positive, alerting to the CPRC and treated in isolation (Table 2). These cases were conducted under the Malaysian law; Section 14: Prevention and Control of Infectious Disease 1988 (Act 342).

3rd of February 2020 — A Malaysian individual was confirmed positive for COVID-19. The individual was a 41-year old Malaysian gentleman with a history of recent travel and attended meetings at a neighboring country. He was reported to be COVID-19 positive. He travelled from the 16th to the 23rd of January 2020, which resulted in having close contacts with delegates from China. He was admitted on the 29th of January 2020, tested positive for COVID-19 and had received treatment in Sungai Buloh Hospital. From the 30th January 2020 to 8th February 2020 - As the numbers of COVID-19 positive cases rose, the PUI cases recorded also had increased. A total of 336 PUI cases were reported with 213 cases involving Malaysian citizens, 115 China citizens and the other individuals were from Australia, Bangladesh, Brazil, Indonesia, Jordan, Canada, Korea and Thailand. 7 of these cases were tested positive, 306 cases negative and the remaining 23 cases were pending in results as of the recorded date.

Ministry of Health (MOH): Reinforcement measures

In view of the rising number of cases due to the increase in multinational citizens arriving in Malaysia, MOH further reinforced preventive and disease control measures.

i. Thermal scanners were placed at the Malaysian borders.
   ii. Individuals traveling back from China who do not fulfill the PUI criteria were given Home Assessment Tool and Home Surveillance for 14 days.
   iii. Individuals with no symptoms were given a Health Alert Card (HAC)
   iv. Random physical examinations were conducted among Malaysians traveling back to Malaysia through the auto-gate.
   v. Specific gates were allocated for flights from China to avoid personal contact with travelers from other countries.
   vi. All ships from China were labelled as "quarantined" ships for thorough examination by MOH
   vii. MOH personnel were alerted if passengers on flights from China have respiratory symptoms
   viii. Malaysians were advised to not travel to China. Preventive and disease control measures were re-informed.

In February 2020 - The Agencies led by the Ministry of Health of Malaysia were involved in transporting Malaysians back to Malaysia. The mission was divided into 4 phases: (1) Mission prior to departing from Wuhan, China. (2) Mission while traveling back to Malaysia (3) Mission when arriving in Malaysia and (4) Mission of admission of individuals to Isolation and Quarantine centers. Every individual was screened at the exit screening conducted by the Health Officers at the Wuhan Tianhe International Airport prior to departing to Malaysia. Once arrived in Malaysia, the individuals were escorted to the Air Disaster Unit (ADU) for decontamination and health entry screening. Symptomatic individuals were transferred to the designated government hospitals for treatment and the remaining individuals were sent to the Isolation and Observation Unit for health screens prior to being allowed home.

6th February 2020 - MOH formed a Mental Health Psychosocial Support Services (MHPS) for ensuring the Malaysians involved received adequate psychosocial support and counseling at the Isolation Centre. Among the individuals being counseled, 2 of them had to be given medical treatment for acute stress and anxiety. Activities related to Psychosocial First Aid (PFA) were conducted. Institute of Medical Research (IMR) was officially known to be the diagnostic laboratory for COVID-19.

A method known as the Conventional RT-PCR was used in diagnosis. The virology unit of IMR formed the reagent sequence known as "primers and probes specific for COVID-19". IMR Protocol was used in sync with the real time RT-PCR COVID-19 released by WHO, based on Corman et. al 2020. Despite all measures, the alarming rise in COVID-19 spread was rapid. The cases reported were increasing exponentially resulting in the need for more drastic actions. The spike of increase was noted to be due to massive gatherings, wedding ceremonies, heavy traf-
Table 3. Total cumulative number of UMMC cases from 17th March — 6th April 2020.

Data courtesy of the UMMC Taskforce

<table>
<thead>
<tr>
<th>Date</th>
<th>17/3</th>
<th>19/3</th>
<th>21/3</th>
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<td>536</td>
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<td>19</td>
<td>19</td>
<td>28</td>
<td>34</td>
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<td>3</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>2</td>
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<tr>
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<td>-</td>
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Data tabulated above were the number of patients admitted in the span of the RMO. The table below summarizes the total number of patients screened, total number of persons under investigation and the total number of positive COVID-19 patients as well as the hospital’s discharge rate and deaths from the 17th of March to the 6th April 2020.

COVID-19". This is to ensure the MCO is abided by Malaysians. Malaysia's military forces were mobilized on the 22nd of March 2020 to assist PDRM in ensuring the order is effectively conducted. All businesses such as supermarkets and restaurants including food delivery services as well as agriculture and fishing industry were allowed to operate according to the scheduled times. Further traveling restrictions and measures were instilled starting 1st April 2020. A strict 10 km travel radius for all travelers except for medical purposes were enforced. All types of gatherings except for funerals were banned.

"Enhanced Movement Control Order" (EMCO) were implemented in specific locations on the 27th of March 2020. There were large clusters was detected positive for COVID-19 and the residents in those clusters had to abide by the EMCO. They were subjected to stricter order and were asked to quarantine themselves for 14 days at home to curb the spread of the virus.

- All residents and visitors within the area are forbidden from exiting their homes during the order.
- Non-residents and visitors outside the area cannot enter into the area subjected to the order.
- All businesses are not allowed to operate.
- Adequate food supplies will be given by the authorities during the 14 day-order to all residents by the Government.
- A medical base will be established within the area.
- All roads into the area are blocked.

During the first phase of the lockdown period, the Malaysian Institute of Economic Research (MIER) analyzed the status of COVID-19 in Malaysia and plotted a graph that describes the trend of increase (Figure 1). The Malaysian Institute of Economic Research (MIER) plotted the current state of COVID-19 pandemic over a period of five weeks, 1.3.2020 to 5.4.2020. This is to study the trend of spread, tracking of the progression and to further compare the MIER Projected Trajectory (in red) against ACTUAL Trajectory (in blue) over a 13 day period of the lockdown phase, 24.3.2020 to 5.4.2020. The data was sourced from the Ministry of Health Daily Reports on COVID-19. The bar graph clearly displayed a steady increase of actual confirmed new cases (grey) and projected cases by MIER (orange) from the start of the lockdown order till early April 2020. There is, however, a reducing trend in actual new confirmed cases (in blue) when tracked against the projected figures of MIER (in red) till 5.4.2020. Although it is still in early days, it seems to implicate slight flattening of the curve, indicating signs of slowing down. Thus, favoring some impact from the lockdown exercise and efficient healthcare management.

# UNIVERSITY MALAYA MEDICAL CENTRE (UMMC)

**Introduction and COVID-19 Patients Data**

The Ministry of Health (MOH) has identified a large number of
bedded hospitals centralized in main cities, like Kuala Lumpur and Selangor to be COVID-19 center hospitals. These hospitals include Sungai Buloh Hospital, Hospital Kuala Lumpur (HKL), UMMC and other surrounding hospitals.

University Malaya Medical Centre (UMMC) is the first university hospital in Malaysia designated to manage COVID-19 patients. In the period of MCO, the number of patients admitted to various tertiary and secondary hospitals were recorded. UMMC being the lead university hospital in management of COVID-19 patients were prepared for every eventuality. The Emergency Department of UMMC was equipped with triage locations and screening counters to vet through patients with early symptoms of COVID-19. Those with symptoms were directed to isolated tents and nasal / oropharyngeal swab tests were conducted. Patients with positive swab results were immediately admitted in isolation to respective wards. Equipped with protective personal equipment (PPE), a specialized group of medical officers, specialists and consultants were working in shifts to manage these patients. The medical officers in the Anesthesia and Intensive Care Unit (ICU) department were also rostered in shifts to manage the patients in ICU.

UMMC: The Management Protocol

The following discussion includes management protocol in UMMC.

Patient triaging

Triaging is defined as the sorting out and classification of patients or casualties to determine priority of need and proper place of treatment. Patient triaging is particularly important during an outbreak of infectious diseases such as this, and other massive calamities and emergencies.

The management of COVID-19 starts with triaging. Triaging tents are prepared outside the Emergency Department (ED) and screening counters are conducted by trained health personnel. A series of screening questions are conducted in vetting through the patients. The questions mainly consist of history of personal contact with ill individuals, travelling history within the last 14 days, history of attending mass gatherings and history of symptoms of respiratory tract infection. Once completed, the patients will be directed to have their nasal and oropharyngeal swabs taken. Symptomatic patients will be placed in designated areas in ED. This area is known as the 'pneumonia zone'. If the patient is a COVID-19 suspect or commonly known as 'Person under Investigation' (PUI), the respective COVID team in ED will notify the Medical COVID team. If the team encounters a need for ICU admission or for oxygen support and airway protection, the ED COVID team will do the needful care before referring the patient to the Anesthesia COVID team. Stable PUI, however, will be admitted to the respective infectious disease (ID) wards while waiting for swab results.

Confirmatory investigation

Nasal and oropharyngeal swab — This is the confirmatory test for COVID-19. The sample container and requests are labelled and completed. A sterile ‘Dracon’ or Rayon swab with plastic shafts is used. Swabs with wooden sticks or calcium alginate swabs are not used as these swabs may contain contents that inactivate some viruses and inhibit PCR testing. The operator handling the sample is fully equipped and protected by PPE. The oropharyngeal swab is performed over the posterior pharynx behind the nostrils, followed by a nasopharynx swab. The stick is rotated 5 times and held for 5 - 10 seconds to collect the sample material. The sample is immediately placed in the viral transport media held by an assistant operator. The media is immediately transported to the lab in ice. PPE is maintained throughout the procedure. The swab samples are tested twice a day in our microbiology laboratory at 1000 H and 1400 H respectively. Samples received after 1400 H will be processed at 1000 H the next morning. The turnaround time is 24 hours. Tracheal cultures are additionally taken in intubated patients. The sterile samples...
Summary of steps of management of Unstable PUI / COVID-19 positive patients

1. The PUI / COVID-19 positive patient presents to the Emergency Department
2. In respiratory distress
3. Intubation by the ED team
4. Appropriate infection prevention and control measure is maintained throughout intubation
5. The COVID-ICU team is alerted
6. Admission of the patient to ICU

Information courtesy of UMMC Anesthesia Department

Summary of the PUI or COVID-19 patients who warrants ICU admission

1. The PUI / COVID-19 positive patient in the ward
2. Patient requires oxygen support of 6L/min face mask or higher and/or
3. High risk patients - pregnant, obese, multiple comorbidities
4. The Medical COVID-19 team to alert the COVID-19 ICU Team
5. Consider ICU admission if:
   1. Patient is unable to maintain oxygen saturation (SpO2) > 95% on 6L/min face mask and Respiratory rate (RR) > 22 breaths/min AND / OR
   2. PaO2/FiO2 < 300 (based on ABG) AND / OR
   3. Multorgan failure AND / OR
   4. qSOFA score > 2 points
6. Admission of the patient to ICU

qSOFA score (also known as QuickSOFA)

Its calculation uses three criteria:
1. Low blood pressure (SBP < / = 100mmHg) = 1 score
2. High respiratory rate (> / = 22 breaths/min) = 1 score
3. Or altered mental state (Glasgow coma scale < 15) = 1 score

Any patient with sepsis located outside of the ICU with a qSOFA score of = / > 2 scores has a higher risk of death or prolonged ICU stay

Management of COVID-19 patients

Admission to ward and management — Symptomatic patients with suspected COVID-19 status are admitted to designated wards, mainly in the infectious disease (ID) wards. As the number rises, the Surgical and Orthopedic wards are also converted to COVID-19 based wards. This is to accommodate for the increasing number of admissions. A routine blood investigation is conducted, and treatment is given upon confirmation of diagnosis. The general well-being of the patients is being monitored frequently and any deterioration in clinical condition is alerted to the ICU COVID-19 team. Patients with increasing need of oxygen support warrants an ICU admission based on the qSOFA scoring system. qSOFA score is a scoring system developed to identify patients with suspected infection who are at greater risk for a poor outcome outside the intensive care unit (ICU)³.

Admission to ICU and management — Symptomatic patients requiring higher oxygen support and ultimately intubation would require ICU admission. Majority of the patients in ICU would require high flow nasal cannula (HFNC) and close monitoring of oxygen saturation (Spo2). Patients with severe symptoms, worsening of blood gas parameters would require that they be repositioned to a prone position. Studies have shown that the practice of prone position improves oxygenation and increases chance of recovery. Non-ventilated patients are requested to change position to prone for a tolerable duration. Patients are able to tolerate the prone position at most, for 4 — 6 hours. Remarkable results are seen with such measures⁴.

The ICU team also works closely in hemodynamic monitoring and keeping patients in an optimized state of fluids and blood pressure. The close monitoring of blood pressure and regular arterial blood gas sampling requires an arterial line insertion upon admission. Optimal oxygenation is monitored with arterial blood gas (ABG) as a guide. Close oxygen saturation monitoring is required in determining the escalation or de-escalation of oxygen support. Most patients admitted to ICU require oxygen support through high flow nasal cannula (HFNC) or intubation. Occasionally, invasive procedures are conducted on patients who develop complications or concomitant infection. The common procedures include, central venous line insertion for administration of inotropic, and double lumen insertion for continuous renal replacement treatment (CRRT) in patients with acute or chronic kidney disease. In performing such procedures, extra precautions are to be taken with full donning of PPE.

Individualized treatment by the ID team — Individualized management is practiced based on the severity of their symptoms. Every PUI and positive COVID-19 patient is admitted in isolation with regular vital signs monitoring from outside their rooms. Routine blood investigations such as full blood count, coagulation profile and blood biochemistry are taken upon admission. Other infection-related biomarkers like procalcitonin, serum ferritin and C-reactive proteins are also monitored during admission. Other possible co-infections like bacterial or fungal infection are treated accordingly. The antimalarial of choice in treatment during admission is Hydroxychloroquine. Antiretrovirals such as Ritonavir and Lopinavir (Kaletra) are also used in treatment of COVID-19. In some instances, subcutaneous Interferon is given. In atypical pneumonia, Doxycycline is the choice of antibiotic⁵.

Infrastructure in managing ventilated patients — Every room housing the patients are negative pressure rooms with a clear glass wall facing the outside environment of the ICU. Each patient is monitored from outside the room by the staff in-charge. The ICU can accommodate intubated and ventilated patients in a 22 bedded ICU, while the Cardiothoracic ICU (CICU) can accommodate more than 4 intubated and ventilated patients. If the need arises, the whole ICU and CICU can be converted into an exclusive COVID-19 ICU. The operation theaters are also prepared to be converted to COVID-19 ICUs if more patients require ventilatory support. The readily equipped ventilators enable almost all the operation theaters to function as COVID-19 ICU.
Communication in ICU — Due to the physical barrier with infected patients, UMMC has adopted the idea of communicating with patients and staff on duty with ease, from inside the isolated rooms through a ‘walkie-talkie’. The need for accurate transfer of information and communication between staff to staff and staff to patient, is of great importance to ensure no communication error. Every bed gets a pair of ‘walkie-talkies’ which breaks that communication barrier and considerably eases patient’s management.

Personal protective equipment (PPE) and health personnel

Personal protective equipment (PPE) — PPE is required in handling all PUI and COVID-19 positive patients. PPE consists of a white coverall (Tyvek suit) or a full yellow gown, a plastic apron, an N95 respirator, a head cover, a face shield, and shoe cover as well as two sets of gloves for double gloving. Hand hygiene as per protocol is performed prior to donning the PPE. Upon completion, the doffing of PPE is also strictly adhered to step by step. Hand hygiene is performed after removal of gloves and at every step of the doffing step. Every health personnel are required to take a surgical bath after doffing out of the PPE. PPE is of utmost importance for health personnel with direct contact to patients. Aerosolized procedures such as intubation and other airway related procedures are considered procedures that are high risk of exposure, thus a breach in PPE would warrant the personnel to be managed under the Occupational Safety Health & Environment Team (OSHE). The individual would be investigated, isolated and quarantined as a safety precaution[10]

Health personnel — Every patient is admitted to a designated ward managed by the COVID ID team. The health personnel work in shifts and the doctors are on regular on-call. Each ICU COVID team works in three shifts. Every health personnel in direct contact with the patient is required to be in PPE. Nurses work in teams and each nurse has a nurse ‘buddy’ to double check on each other and ensure full compliance of PPE i.e. the donning and doffing step to ensure safety. Nurses are in-charge of general care as well as monitoring of patients from ensuring good oral intake in awake patients to administration of medication.

Occupational Safety Health & Environment Unit (OSHE)

OSHE is a team that consists of a group of health personnel in-charge of ensuring the safety of doctors and frontline healthcare workers. In the medical field, every doctor is exposed to healthcare related diseases like COVID-19. The risk every personnel face going to work every day requires extra precautions to be taken. In an event any staff gets exposed to the disease directly, the OSHE team will be alerted and the individual will be monitored closely for development of symptoms. Staff, particularly doctors and nurses who develop viral like symptoms will have to inform the OSHE team.

A nasopharyngeal swab will be taken as a preliminary step in confirming diagnosis. Those with close contact to COVID-19 patients and start developing symptoms will be asked to quarantine themselves for 14 days (incubation period) to avoid possible transmission of the disease. Daily updates of current condition will be updated to the OSHE team via smartphone group messages. OSHE will alert the respective departments and the staff will be excused from work for 14 days. The individuals will be monitored by the OSHE team closely for further worsening of symptoms. A negative nasopharyngeal swab result warrants a reconsideration by the OSHE team and the department for the staff to be allowed back to work. Most staff, if not symptomatic, would be allowed back to work but still monitored closely within the 14 days of initial presentation. Up to date, the OSHE team has been devoted from the beginning in ensuring every health care individual is well taken care of during this period.

UMMC COVID-19 Task force

UMMC COVID-19 task force is a team formed during the worsening of the COVID-19 outbreak. This team led by the ED specialist functions in ensuring proper execution of plans planned by the higher authorities in UMMC. The information and knowledge regarding COVID-19 is also being disseminated by the task force. Every department forms a team of doctors to execute and inform updates given by the task force. This information dissemination from higher level to the ground is efficient with the task force at work. The information educated is also reassessed through online assessments and regular monitoring of safe practice among staff in UMMC. Regular updates of current status of COVID-19 in the hospital is also updated through smartphone group messages and emails to ensure the staff in UMMC are frequently updated on important information. The effective communication ensures excellent knowledge and good teamwork in managing COVID-19 in UMMC.

CONCLUSION

The article was able to conclude the occurrence of COVID-19 in Malaysia and highlighted step by step healthcare management in various phases and different departments. Safety measures were also highlighted to protect the hospital environment, medical personnel, and patients at large. It is hoped that this humble effort of documentation will be of benefit to all healthcare frontliners all over the world.

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