

Disaster Management Zone (DMZ): Military Pharmacists Preparedness and Adaptation in COVID-19 Treatment Centre

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ABSTRACT

The COVID-19 pandemic struck Malaysia in early 2020, creating an unexpected public health emergency and straining medical facilities. The exponential growth of moderate to severe COVID 19 patients in healthcare centers in Klang Valley particularly, had become an enormous burden to the health care system. The Disaster Management Zone (DMZ) located in Tuanku Mizan Armed Forces Hospital was activated to support the Greater Klang Valley Task Force (GKVTF) to cope with this situation. Military pharmacists collaborated with other healthcare professionals to optimize the use and purchase of medications and consumables despite unforeseen challenges throughout the operation of the DMZ. Many lessons were learnt throughout this unforeseen experience, for example the need to explore digitalization of pharmacy management systems. This could be the best way forward as it reduces overall workload, minimizes medication-related errors, and ultimately improves pharmaceutical care.

Keywords: COVID-19, Military Pharmacy, Disaster Management, Military Hospital

INTRODUCTION

The COVID-19 pandemic is an unprecedented public health emergency that has taken a toll on healthcare services when it struck Malaysia in early 2020. The healthcare system was put under immense pressure and was overstretched almost beyond its capacity. The surge of moderate to severe COVID-19 patients requiring intensive care in Klang Valley had prompted healthcare leaders to be innovative in managing the crisis.

Following this, Tuanku Mizan Armed Forces Hospital officially launched its ever-ready Disaster Management Zone (DMZ) to assist the Greater Klang Valley Task Force (GKVTF) novel initiative to curb this issue. Initially, the DMZ housed a total of 150 beds for COVID-19 category 3, 4, and 5 patients. As the occurrence of the Delta variant became more dominant in Malaysia, Covid-19 cases continued to increase, forcing DMZ to expand its capacity to 175 beds. To complement and complete DMZ operation, the pharmacy department revamped its operational strategy to adapt to the rising challenges and fulfil all stakeholders' needs.

The DMZ was derived from a basement car park specially designed to be converted into a mass disaster management area in cases of chemical and biological disasters. It was supported by existing facilities that have been built into the area in terms

of electrical power supply, oxygen supply, vacuum ports, and other medical support assistance that can handle patients within its capacity. The patients were mainly admitted from local emergency departments, nearby Covid Assessment Centres (CAC) in the Klang Valley, low-risk quarantine centres (Pusat Kuarantin Risiko Rendah / PKRC) MAEPS 2.0 in Serdang, and nearby hospitals. Throughout its operation of over three months, DMZ has catered to a total of 1091 adult patients from all walks of life.

Military pharmacists were responsible for medication supply to DMZ ward, floor stock medications management, dangerous drug & psychotropic supply, disposable items supply and control, decontamination of returned medications, medication reconciliation and dispensing of discharge medications, performing pharmacotherapy rounds, stock monitoring, and continuous education among staff.

Military Hospital Operation During Normal Times vs Transformation During Pandemic

Staffing

Each staff member is usually assigned fixed tasks during normal times according to their rank and qualification. The staff for each unit is adequate to cater to the demand of 250 inpatient beds and 300-400 clinic patients. Operation hours are from 0800H-1700H for office hours and 1700H-0000H for after office hours to ensure a timely supply of medication.

Before DMZ operation, TMAFH had been receiving patients from other general hospitals who needed to decant when they were converted to COVID-19 hospitals. This has doubled up the pharmacy department's workload in terms of inpatient medication supply and discharge medication. The opening of DMZ which has a high patient turnover rate then caused a further substantial increment in inpatient medications demand.

Under TMAFH Head of Pharmacists' command, the pharmacy department reorganised its operation and created a DMZ Pharmacy Team. The team consists of one military pharmacist and six military assistant pharmacists pooled from military units all over Malaysia. This team was also assisted by a mobilisation team from the Ministry of Health Malaysia. The integration of ministries that provide healthcare services allows for the most efficient use of scarce medical resources ¹. With a larger workforce on-site, it enabled the existing TMAFH services and additional responsibilities from the DMZ to run smoothly.

Ward Medication Supply and Indenting System

During normal times, a scheduled ward medication supply uses a manual unit of use (UoU) system. This system is used to distribute inpatient medicines to individual patients for a duration of three to four days. This system was favourable as TMAFH had limited human resources as our military pharmacists and assistant pharmacists were not spared from other military duties such as field officer, night guard duty, and military camp guard duty on top of pharmacy active on-call duty.

In the beginning, the DMZ pharmacy team op room maintained the same standard operating procedure as in the inpatient pharmacy. Prescriptions were written by the attending doctor; one copy was sent to the pharmacy for medication supply and another copy was slotted into the patients' medication chart to guide medication preparation and administration. Medication charts were kept in the yellow zone to make it easier for staff nurses to prepare medication without donning full PPE. On day 2 of operations, DMZ changed its method of ward round whereby patients' bed head tickets and medication charts were brought into the red zone. Following this, medication nurses needed to prepare medications in the red zone thus the need to bring in patient's medication charts and medication trolleys into the red zone. In the effort to minimise any possibility of cross-contamination & transmission of Covid-19 virus to the pharmacy, rewriting prescriptions in the yellow zone was made compulsory. However, there were various issues from this practice such as double prescriptions, polypharmacy, and wrong administration route (intravenous to oral and vice versa). These could have been prevented if electronic prescribing was made available ²⁻⁵.

Due to the lack of a digital management system, the DMZ Pharmacy Team took various innovative measures to ensure medication safety and prudent use of medicines. Rewriting prescriptions was abolished and changed to scanning medication charts via printer from red zone direct to the pharmacy. In the red zone where full personal protective equipment was required, military assistant pharmacists checked & indented floor stock and emergency trolley medications using Google Sheets on a daily basis. These methods were cost-effective and most importantly they were paperless, reduced errors and contactless.

Pharmaceutical Care Issues

In May 2020, the Institute of Safe Medication Practices (ISMP) highlighted various issues regarding potential medication errors in hospitals during the Covid-19 pandemic ⁶. Correspondingly, throughout DMZ operation, military pharmacists encountered and intervened many medication-related issues such as wrong medication served, wrong administration time, missed medication, right medication served to wrong patient, incorrect administration technique, and inappropriate medication dilution and storage.

In order to ensure safe medication practice, the Military pharmacists would execute daily pharmacotherapy ward rounds in the red zone. The necessary pharmaceutical care interventions

and medical device counselling were carried out accordingly. Medication counselling is best carried out via face-to-face method thus it was made a priority whenever feasible. However, for those who had time constraints and physical access limitations, tele-counselling was offered via Whatsapp Video Call. Apart from that, multiple sharing sessions with doctors and nurses were carried out to ensure safe, efficacious and high quality medication management. A series of continuous education among pharmacists as well as assistant pharmacists were also conducted to make sure they were equipped with the latest guidelines and updates on Covid-19 management. These efforts tremendously reduced the statistics of medication errors, returned medications, and unnecessary ward medication stock while preventing Covid-19 cross-contamination. However, having a digital hospital management system in place could have lessened the overall healthcare burden ⁷.

Discharge Medications

Upon discharge, there were two categories of patients i.e patients with release order (RO) who had completed quarantine and patients with home surveillance order (HSO) who still had a few days left before finishing their quarantine. The pharmacists were responsible to perform medication reconciliation, counter check medications prepared by assistant pharmacists as well as dispensing medications to patients with RO and HSO. Throughout DMZ operation, there were a few medications issues intervened including corticosteroid dose conversion, medical logistic issues, and counselling for patients newly started on insulin, inhalers, and anticoagulation. These issues were overcome with timely communication among doctors, nurses, medical assistants, and other healthcare providers.

Stock Monitoring

Medications and consumables supply shortages were a major worldwide challenge during the early Covid-19 pandemic. As severe Covid-19 cases skyrocketed, personal protective equipment (PPE) and medications usage inevitably increased exponentially. Weekly meetings to coordinate and monitor Covid-19 medications and consumables movement were carried out to ensure appropriate measures were taken discreetly. Clinical military pharmacists equipped the DMZ pharmacy team with a list of medication regimens according to the latest national Covid-19 treatment guidelines after reaching a consensus with the physicians in charge. Using Microsoft Excel, the estimated quantity of medications and consumables needed and currently available stocks were updated on a weekly basis. This action successfully eliminates the issue of medication and consumables shortage in DMZ. However, this manual process is highly susceptible to human error which prompted the team to counter check the spreadsheet line by line.

CONCLUSION

The COVID-19 pandemic has tested the military pharmacy readiness in managing medications supply and utilisation. It also provided the opportunities to strengthen military pharmacists' skills and knowledge in responding quickly to the

call of biological disaster management as well as emergency relief operations. In addition, digitalization in the pharmacy management system is deemed important to assist in efficient delivery of pharmaceutical care, especially in this fast-paced era.

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