



## Challenges encountered by Emergency medicine physicians in the era of COVID-19: Future perspectives and recommendations

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### ABSTRACT

The currently ongoing COVID-19 pandemic has undoubtedly affected the health care system in a significant manner, having a particularly major impact on emergency medicine. This study aimed to review the challenges faced by the emergency medicine department during COVID-19. Additionally, it provides an overview of future perspectives as well as recommendations to effectively and innovatively address similar challenges in the future. Different articles were extracted through databases such as Google Scholar and PubMed. This was followed by a review of a number of full-text research articles that were published in the English language both in developed and developing countries with a specific focus on emergency medicine and COVID-19. All primary research articles were further examined for information pertinent to the objective. Some of the many challenges that are faced by emergency departments include overcrowding of patients, shortage of staff, limited infrastructure, fear and anxiety of staff due to the contagious nature of the virus, the lack of trained consultants, and no separate isolation rooms for COVID-19. These challenges need to be considered as opportunities and addressed with innovative strategies such as the formation of think-tanks, conducting a SWOT analysis, training registered medical staff to diagnose cases of COVID-19 correctly, making data-driven decisions, using spilt patient flow approach, implementing tele-emergency medicine, and considering robotic training in the field of emergency medicine. Like all healthcare specialties, the emergency department has faced tremendous challenges during COVID-19 that need to be addressed by taking steps in a more systematic and organized way. These challenges are a potential threat in the short run but should also be considered as learning opportunities for the future.



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### INTRODUCTION

The ongoing COVID-19 pandemic has become a cause of public and clinical health concern across the Globe (Wenham *et al.*, 2020). The existing literature on the epidemiology of the virus reveals that COVID-19 is a highly infectious and lethal disease caused by SARS-COV2, which has become a cause of stress and anxiety among the public as well as healthcare professionals (Du *et al.*, 2020). Coronavirus is one of the types of pathogens that chiefly target the respiratory system of human beings (Lai *et al.*, 2020).

The issue of COVID-19 became more prominent after the isolation of cases with pneumonia-like symptoms in one of the provinces of China (Du *et al.*, 2020). More specifically, a number of patients were admitted to hospitals with a primary diagnosis of pneumonia of an unknown etiology in December 2019 (Rothan and Byrareddy, 2020). This was followed by a swift spread of the disease from China to other parts of the world until it was eventually declared a pandemic by the World Health Organization in March 2020 (Saglietto *et al.*, 2020). Since then, COVID-19 has drawn unprecedented attention from clinicians and healthcare providers in all disciplines such as family medicine and emergency medicine as well as public health researchers (de Sutter *et al.*, 2020).

With exponentially rising infections, almost equal proportions of mortality are being reported from low and upper-middle-income countries (Maier and Brockmann, 2020). Millions of cases and mortalities have been reported throughout the world. As a result, almost every country in the world has implemented extensive control measures. In addition, the high risk of human-to-human transmission of the virus has obliged administrations of many countries to take strict preventive measures (Huang *et al.*, 2020). These measures have included lockdowns, closing hospitals, social distancing, and postponing or even cancelling procedures to be performed in the hospitals (Peng *et al.*, 2020). Although these measures were taken in order to curb the spread of the virus and save lives, they have had a significant negative impact on healthcare departments that had previously offered their services to patients at all times (Weissman *et al.*, 2020).

One of such departments is emergency medicine, where consultants and other junior physicians have to provide continuous services to the patients. The massive demand for hospital resources in order to treat COVID-19 cases has challenged healthcare providers in a variety of disciplines. The closure of hospitals has diverted the flow of patients to the emergency departments, which in turn became a challenge for the physicians and consultants in emergency medicine. Consequently, a plethora of difficulties were faced by emergency medicine physicians, which should be viewed as a learning opportunity for the future of emergency care. This, in turn, will allow emergency consultants to plan for the future and address new uncertain crises efficiently without compromising the care of the patients. Thus, this article aims to review the obstacles faced by the emergency medicine department during COVID-19 as well as providing an overview of future perspectives, with recommendations for

ways to address similar challenges effectively.

## MATERIALS AND METHODS

Articles were extracted from databases such as Google Scholar and PubMed after conducting text-word and vocabulary searches. The articles that were published on the topic of emergency medicine and COVID-19 were further examined for evidence to support the authors' hypotheses. All articles were searched by using search terms such as 'challenges faced by emergency medicine consultants and COVID-19', 'Emergency medicine consultants, and COVID-19', 'Challenges in the field of emergency medicine and COVID-19 pandemic' and 'Future directions in the field of emergency medicine and COVID-19'. The search was limited to the articles published in the English language; however, the review included studies conducted both from developing and developed countries. All articles pertinent to the study's objective were examined while writing this opinion article to support the authors' point of view based on the available premise. Given the duration of the COVID-19 pandemic, the search was limited to the period between 2019 and 2020 by applying filters for the time duration while searching for the articles in the databases. All eligible articles were identified in the chosen databases by using a snowball sampling technique consisting of backward and forward reference searching of articles. Moreover, all the references for the eligible articles were also reviewed to avoid missing any article appropriate to the objective. After searching different databases and following the above criteria, the authors reviewed the full-text articles of the studies that highlighted the issues, challenges, and future direction in the field of emergency medicine during the COVID-19 pandemic.

## FINDINGS

Based on the search and review of relevant articles as well as the main objective, the findings were broadly divided into two main sections. The first section summarizes the challenges faced by consultants in the field of emergency medicine, while the second section features a discussion on the recommendations and future perspectives for emergency medicine in order to prepare physicians for other potential outbreaks.

### Section 1

#### Challenges experienced by consultants in the field of emergency medicine during the era of COVID-19

Generally, given the unpredictable nature of the

COVID-19 pandemic, physicians in the field of emergency medicine experience diverse challenges. Most of these challenges can be attributed to the rising flow of patients, the shortage of staff, the imbalance in staff-patient ratio, a lack of medical supplies relative to the number of patients, inadequate infrastructure of the emergency department, and fear of contacting COVID-19 patients at the front-line. Due to the effect of COVID-19, most of the outpatient departments (OPDs) have been closed in the health systems of many countries, thus diverting the patients from OPDs to the emergency department (Carter *et al.*, 2020). This has led to severe implications in terms of increased and unnecessary burden on the staff of emergency medicine, particularly consultants, who are already very few. In addition, this divergence of patients might result in compromised care for patients who need actual emergency care with proper attention. Moreover, an increased ratio of COVID-19 cases has overburdened the staff of emergency medicine and simultaneously caused them to develop fear, anxiety and stress due to the contagious nature of this disease (Lu *et al.*, 2020). As a result, emergency medicine staff might not pay the required attention to the patients, resulting in immoral and unethical care.

In addition, a high number of COVID-19 cases need to be isolated in separate isolation rooms in the emergency department in order to avoid contact between non-COVID-19 and COVID-19 patients. However, most of the emergency rooms in small hospitals are not well equipped to retain patients in isolation (Iacobucci, 2020). As a result, either COVID-19 and non-COVID patients are kept into the same area, or patients are referred to other hospitals, sometimes risking their lives on the way while moving from one hospital to another. Similarly, these increased numbers of patients have also resulted in an extra burden on the emergency medicine staff, who become overwhelmed and are therefore more susceptible to making errors. This extra burden on the emergency medical staff can also affect the physical and mental health of the health care providers working in emergency medicine. This might be more challenging for the emergency medical staff in developing countries due to the scarcity of human resources. This is further exacerbated when areas have larger populations nearby emergency departments are closed down, which can cause patient wait times to increase dramatically in emergency departments. Prolonged waits induce patients to leave without receiving treatment, creating a public health problem.

Apart from this, emergency medicine departments

usually lack sufficient numbers of consultants who are experts in the field of emergency medicine; rather, these emergencies are handled by registered medical doctors who are not adequately trained to differentiate between COVID-19 and non-COVID patients. Given the non-specific symptoms of COVID-19, it is possible to easily miss true cases based on clinical judgment, resulting in false-negative cases. These false-negative cases can be a potential threat to society and can lead to an upsurge in COVID-19 cases with an increased reproductive rate of the virus. On the other hand, if the physicians in the emergency room over-diagnosed the false cases and considered all negative cases to be positive, this would lead to a higher number of false-positive cases, thus overburdening the health system—mainly the emergency department, or even the next level of care such as isolation rooms and the hospital wards.

The increasing number of COVID-19 cases has resulted in competition for medical supplies and personal protective equipment such as masks, gloves, and eye shields, gowns, and hand sanitizers (Ranney *et al.*, 2020). As a consequence, not all staff members in the emergency medicine department are provided with these necessary supplies to protect themselves from catching an infection and ensure their safety (Ranney *et al.*, 2020). This not only puts emergency medicine staff at risk but also creates a sense of uncertainty among the staff. As a result, the emergency medicine staff can either catch the infection or resign and leave the emergency medicine department, thus creating a vacuum that will take time to be filled (Ranney *et al.*, 2020). This, in turn, will compromise the care of patients in the emergency department leading to a vicious cycle of inadequate care of sick patients.

## Section 2

### Recommendations and Future Perspectives for the Emergency Medicine department

Given the aforementioned challenges, the administration of the emergency department needs to plan and devise some cost-effective, innovative, and sustainable strategies to provide adequate care to both COVID and non-COVID patients during the ongoing crisis. First of all, there is a need to increase emergency medicine staff in order to meet the rising number of patients. It is also equally important to give appropriate breaks to the staff to avoid overwhelming and exhausting them. The environment of emergency medicine is usually tense and full of stress due to the nature of complaints patients are presented with. During this environment, the staff needs to remain calm and composed to handle serious cases

and isolate the COVID-19 cases correctly.

Secondly, the emergency medicine department requires the specific skills of healthcare providers who are particularly trained in the field of emergency medicine. This means that emergency departments should have enough consultants, who can correctly diagnose the cases without giving false-positive or false-negative results (Watson *et al.*, 2020). It might not be feasible for the healthcare system of any country to produce an increased number of consultants in emergency medicine overnight; however, registered medical doctors can be provided with rapid and quick training to at least properly diagnose COVID-19 patients and avoid adding an unnecessary burden to the hospitals due to false-positive cases. Furthermore, these medical doctors also need to be supervised by senior emergency medicine consultants periodically to ensure proper and timely care for the patients.

One crucial step in addressing this issue would be the establishment of a think tank that comprises experts and consultants in emergency medicine, data managers, and management staff who can make evidence-based decisions on the matter. One of the few responsibilities of the think tank would be to have a dialogue regarding needs of COVID-19 patients and to do a SWOT (strengths, weakness, opportunity and threats) analysis before making any decisions or implementing any changes to the system (Wang and Wang, 2020). This type of analysis will help to investigate the strengths and weaknesses of the ongoing services being provided in emergency medicine. This would be followed by identifying the potential opportunities and addressing any threats or challenges accordingly (Longhurst *et al.*, 2020). This evidence-based framework will help the think tank to identify the root causes of the problems and provide a pathway for potential solutions. Secondly, the think tank will also ensure that the data of COVID and non-COVID patients are properly collected and analyzed in order to make any necessary changes driven by the data. Furthermore, this think tank will have to play the role of a monitoring and evaluation team which makes surprise visits to the emergency departments and monitors the care being provided to the patients during the pandemic. This will help the team members of the think tank to make necessary improvements and changes whenever required to enhance the quality and standard of care in emergency medicine.

With regard to the risk of losing healthcare providers to the infection, it is time for hospital and emergency medicine administration to think beyond human resources and consider robotic and

tele-robotic solutions (Tavakoli *et al.*, 2020). It might not be feasible for hospitals in the developing as well as some developed countries to meet the increasing needs of the patients. Thus, hospitals must think of utilizing robotics in emergency medicine, which could be operated by the physicians remotely (Tavakoli *et al.*, 2020). This will not only reduce the direct contact between suspected COVID-19 or similar patients and the health care providers but will also reduce the burden on the staff in emergency medicine. However, the programming of these robotic machines might be challenging at the beginning and would need to be done carefully to avoid errors and harm for the patients. This can also be supplemented with the digital emergency and digital telemedicine whereby emergency medicine consultants and doctors can assess patients remotely at their homes (Turer *et al.*, 2020). This will help in only referring patients who are in real need of emergency treatment to the emergency room. This will, in turn, save time and energy both at the patient's and doctor's end as well as reducing anxiety for both sides. Concerning the dearth of isolation rooms in emergency departments, it is highly crucial to develop a triage system at the entrance of the emergency department, where serious patients and suspected cases of COVID-19 can be screened properly and moved to isolation rooms if required (Cao *et al.*, 2020). On an urgent basis, hospitals might need to convert any non-emergency areas of the hospital to the emergency department to address the challenge of an increased number of patients (Whiteside *et al.*, 2020). Furthermore, emergency departments can respond to the high demand by using a split patient flow approach that can help separate lower acuity patients from higher acuity patients and prioritize those who need treatment urgently (Cao *et al.*, 2020). Another potential way to address this issue is to develop innovative strategies around the four major resources—staff, supplies, space, and sequence (four S's)—which can improve performance in the emergency departments. For example, increasing the number of staff to address the disproportional staff-patient ratio, ensuring the presence of medical supplies by allocating more resources to the emergency department, expanding the available space by converting non-emergency areas into emergency departments on a short term basis, and the prioritization of urgent and serious cases over more mild cases with proper screening and triage, ensuring that care is directed to those who need it most (Son *et al.*, 2019).

## CONCLUSION

The Emergency Department can be considered the “canary in the coal mine” of any hospital, as it is a vital early indicator of danger. Like the entire healthcare system, the emergency department has faced tremendous challenges during COVID-19 that need to be addressed by putting a better structured and more organized system in place. These challenges undoubtedly pose a potential threat in the short run, but more importantly, they must be regarded as learning opportunities for the future. The current challenges in the field of emergency medicine can be better understood by drawing information from the data in order to make evidence-based decisions. Furthermore, novice solutions such as tele-emergency medicine and the programming of robots can help in screening the rising numbers of patients. This is also quite beneficial because it would protect staff working in emergency medicine from being directly exposed to COVID-19 patients. Such strategies can be complemented by forming monitoring think tanks to do a critical analysis of the situation to propose cost-effective and sustainable solutions on an as-needed basis.

### Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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