


PERSPECTIVE

Emergency physicians' role in telemedicine care during the coronavirus disease pandemic: Experiences from Taiwan

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Abstract

Taiwan's response to the coronavirus disease pandemic received international recognition. Among various epidemic control measures, telemedicine services are provided for people under home quarantine. Although this service presents no policy, cost or equipment problems, the medical needs of people under home quarantine are diverse. Further, there are no clear guidelines regarding which specialists should be included in a multidisciplinary team. Moreover, many physicians are unwilling to participate in telemedicine, creating a big challenge for hospitals providing these services. Emergency physicians (EPs) have unique experiences in crisis management and can provide a number of effective public health measures. We advocate that EPs should be the first specialists to contact patients in a multidisciplinary team. Currently, there is a lack of literature on this subject, and Taiwan's epidemic control experience is used as an example to prove our viewpoint and provide recommendations for future EPs.

Key words: COVID-19, emergency hospital service, quarantine, telemedicine.

The coronavirus disease 2019 (COVID-19) pandemic has spread rapidly, but as of 31 December 2020, there were only 799 confirmed cases and seven deaths in Taiwan, which has a population of 23.8 million.¹ Many academic papers have analysed the reasons for Taiwan's success in epidemic control. These multi-dimensional measures include providing complete daily life support for people undergoing home quarantine.² One of the reasons for the success in home quarantine may be the implementation of telemedicine to meet their diverse medical needs.^{3,4} People undergoing home quarantine require not only symptom monitoring but also consultation for acute or chronic medical problems.⁴ Furthermore, there are no clear guidelines released by the World Health Organization or other professional organisations regarding which specialists should be included in a multidisciplinary team (MDT). In Taiwan, it is extremely convenient to seek medical attention, and most Taiwanese specialists prefer face-to-face consultation and do not understand the applications of telemedicine. Therefore, the willingness of specialists to participate in telemedicine is not high,

which is a common problem encountered in promoting telemedicine.⁵ In addition, during the COVID-19 outbreak, specialists responsible for treating COVID-19 patients (such as infectious disease physicians or respiratory physicians) have been extremely busy or infected.

The lack of staff and low uptake by specialists pose challenges for hospitals in forming a MDT. In the past, emergency physicians (EPs) have used telemedicine in clinical scenarios of stroke, trauma or acute myocardial infarction to provide timely assistance to critical patients.⁶ Compared with other specialists, EPs possess unique experiences in crisis management and can provide a number of effective public health measures.⁶ The present study will use Taiwan's epidemic control experience as a basis for this viewpoint to illustrate the role of EPs in telemedicine care during the coronavirus pandemic.

Taiwan's medical law restricts telemedicine to mountainous regions, outlying islands, and remote areas. However, as COVID-19 is highly infectious, the government has relaxed the restrictions to make telemedicine accessible to individuals under home quarantine. In addition, the new laws stipulate that national health insurance can be used to support telemedicine services. Subsequently, the Taiwan Centers for Disease Control and Prevention (CDC) established a hotline for public consultation in every part of the country. The problems faced by

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people undergoing home quarantine can be directed to the duty staff in the local health bureau through this hotline. If such problems are related to their medical condition, they will be referred to hospitals providing telemedicine. Our hospital, Hsinchu Cathay General Hospital, has been delegated by the local public health bureau to undertake this task. According to the requirements of Taiwan hospital accreditation, the minimum number of EPs and nurses must be proportional to the number of patients per year in any given hospital. The ED can increase the number of staff as the number of patients increase. Therefore, compared to other medical departments, we can manage the increased workload of telemedicine services without compromising our regular emergency services.

During the outbreak, our administrative staff works in shifts and were on call 24 h. They referred the cases received through the hotline to available specialists according to their needs and used the LINE application software to connect physicians and patients by providing live video consultations. This free application is popular in Taiwan and can be used on both smartphones and computers. Therefore, hospitals can offer telemedicine services with off-the-shelf infrastructure. Between 21 February and 31 May 2020, 3462 people were home quarantined in Hsinchu City, of whom 202 (5.83%) used telemedicine consultation. Table 1 shows the telemedicine usage data. There are 19 divisions participating in such services in response to diverse medical needs. Therefore, administrative coordination and support by the

hospital in forming a MDT are necessary.⁴

The specialists who provided services were mostly EPs (32.67%). This finding was expected because EPs worked in 24-h shifts, 7 days a week, and can offer patients immediate diagnosis, treatment or referral. In addition, people undergoing home quarantine often experience psychological stress or develop suicidal thoughts.⁷ If such people seek help at night, EPs can play the role of gatekeepers for suicide prevention. As information regarding COVID-19 was constantly updated, EPs on the front line had a better understanding of the new diagnostic criteria and procedures. Among the 202 people who used telemedicine, 45.54% were transferred to community screening stations for SARS-CoV-2 tests. Hence, selecting patients for testing is an important task in

TABLE 1. Statistical data on specialists and service hours for 202 home quarantines using telemedicine

| Specialists | Number of consultations during working hours (8:00 am to 4:00 pm) | Number of consultations during non-working hours or holidays | Total number of consultations (%) |
|-----------------------|---|--|-----------------------------------|
| Emergency specialist | 10 | 56 | 66 (32.67) |
| Otorhinolaryngologist | 29 | 19 | 48 (23.76) |
| Infection specialist | 8 | 22 | 30 (14.85) |
| Nephrologist | 7 | 4 | 11 (5.45) |
| Family physician | 7 | 4 | 11 (5.45) |
| Chest specialist | 7 | 3 | 10 (4.95) |
| Cardiologist | 3 | 1 | 4 (1.98) |
| Gastroenterologist | 3 | 0 | 3 (1.49) |
| Plastic surgeon | 1 | 2 | 3 (1.49) |
| Gynaecologist | 3 | 0 | 3 (1.49) |
| Neural surgeon | 2 | 0 | 2 (0.99) |
| Paediatrician | 1 | 1 | 2 (0.99) |
| Ophthalmologist | 2 | 0 | 2 (0.99) |
| Dermatologist | 2 | 0 | 2 (0.99) |
| Neurologist | 0 | 1 | 1 (0.50) |
| Orthopedist | 1 | 0 | 1 (0.50) |
| General surgeon | 1 | 0 | 1 (0.50) |
| Psychiatrist | 0 | 1 | 1 (0.50) |
| Dentist | 0 | 1 | 1 (0.50) |
| Total | 87 | 115 | 202 (100) |

telemedicine services, for which EPs are extremely suitable. The daily SARS-CoV-2 testing capacity in Taiwan is approximately 5900 cases per day. EPs could use telemedicine to screen high-risk cases and rationally allocate testing resources to ease the laboratory workload. In addition, during the outbreak, patients undergoing home quarantine were not allowed to go out. Individuals who needed to go to the hospital for medical treatment had to be transported in an ambulance in accordance with the Taiwan CDC regulations, which had put heavy pressure on emergency medical services. EPs assisted in filtering out unnecessary transports, allowing emergency medical technicians to be more available to other patients.

Due to the COVID-19 pandemic, telemedicine services are continuously evolving. For example, Taiwan's Ministry of Health and Welfare is developing an official mobile application platform that will allow patients to pay for and obtain medicine more conveniently. The greatest problems in the use of telemedicine are performing relevant physical examinations and accurately judging disease presentation.⁸ In China, Li *et al.* designed quarantine management assessment scales for telemedicine systems to monitor changes in symptoms and found that they could effectively diagnose patients under observation and make prompt arrangements for inpatient treatment.⁹ Tech companies and hospital are cooperating to develop distant monitoring devices,¹⁰ using artificial intelligence technology

to collect essential vital signs. This allows telemedicine to move beyond solely providing a doctor-patient interview function. In conclusion, EPs perform diverse functions that cannot be substituted by other specialists. To efficiently improve their role, it is necessary to train more EPs on how to integrate evidence-based assessment tools in the consultation process to improve the shortcomings of telemedicine.

Author contributions

C-CF conceived the original idea. T-HW and C-SL collected data. C-MC and C-CF performed the literature review. C-MC and C-SL drafted the manuscript. H-CL and C-CF carried critical revision. All authors discussed the results and contributed to the final manuscript.

Competing interests

None declared.

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