



Evolution of telemedicine in China during COVID-19 pandemic: from 2020 to 2022

Rukun Chen¹ · Qixia Jiang¹ 

Accepted: 22 May 2022 / Published online: 8 June 2022
© The Author(s), under exclusive licence to Springer Nature Limited 2022

Dear Editors,

Since the start of 2020, the COVID-19 pandemic has been spreading all over the world. In response to the acute health crisis with an unprecedented surge in the number of patients, many countries have imposed quarantines and travel restrictions and reallocated resources of health systems. In China, government put lockdowns in place in cities that showed emerging cases of COVID-19. The government had postponed routine medical activities in primary, secondary, and tertiary care facilities across the country to minimize the spread of infection, and to make room for COVID-19 patients. These changes in response to the pandemic challenged the connection between doctors and patients. Prior to the pandemic, medical professionals delivered regular educational lectures to the public filled with health-related recommendations on healthy lifestyle, chronic diseases management, disease prevention, and other topics. In 2020, authorities cancelled all such lectures due to social distancing restrictions in hospitals. The restrictions created an urgent need to reconnect with the patients.

In response to the restrictions, doctors in China started to explore new methods to maintain communication with their patients. In 2020, some hospitals in China launched online visual contact events with the support of live-stream platforms. Hospitals, health organizations, and individual doctors registered accounts and produced live-streams events. Initially organizers focused these events to help in the management of chronic diseases such as hypertension and diabetes. Presenters delivered useful medical information to the public, including demonstrations. But more importantly, these sessions connected presenters and viewers in live interactions. Viewers asked questions and presenters immediately answered. The content offered participants information for better understanding of their illnesses and encouraged them to follow practices to protect their health in the context of COVID-19. The

✉ Qixia Jiang
vivian830505@aliyun.com

¹ Department of Cardiology, Tongren Hospital, Shanghai Jiao Tong University School of Medicine, 1111 XianXia Road, Shanghai 200336, China



theme of events includes, but not restricted to medication, lifestyle recommendation, and management of chronic diseases such as hypertension, diabetes, and coronary artery diseases. One particular event on prevention and treatment of hypertension during COVID-19 attracted more than 700,000 viewers, from all age groups and walks of life across the country. More than 10,000 people fully participated the event by watching the whole programme and interacting with the speaker via live Q&A. The recoding of this live-stream event was then shared by internet users on mainstream media for over 80,000 times, so that people who missed the event or want to rewatch may access the recording freely. The advantages of live-stream events compared to the traditional face-to-face lecture were obvious. Access to these events was no longer restricted by time, capacity, and geographical locations. The magnitude of participation affirmed the successful value of this preliminary exploration of live streaming medical educational activities.

Two years into the COVID era, the end of this global pandemic seems inconclusive. The SARS-CoV-2 virus had mutated several times, and scientists have identified new variants. The variant that is currently attracting attention around the world is Omicron. Many studies have shown that compared to the original virus and the Delta variant, Omicron has higher infectivity [1, 2]. And compared to the situation with Delta in 2020, spread of these Omicron variants is harder to prevent. Although China has been controlling the situation well, in late February 2022, a wave of SARS-CoV-2 BA.2.2 sub-lineage hit Shanghai. According to the statistics published by the Shanghai Municipal Bureau of Statistics in 2021, 23.4% of the population in Shanghai is older than 60 years of age [3]. As a city with more than 26 million people and an ageing population, the challenge Shanghai faced this time is incomparable to previous outbreaks in China [4]. By 14 May 2022, more than 600 thousand people in Shanghai have been infected by SARS-CoV-2 in this new outbreak in Shanghai [5]. Based on China's 'zero-COVID' policy, Shanghai started two phases of 'static management' to prevent any further spread of the virus. Based on the number of new cases found in each community, authorities categorized communities into three types: zones for lockdown, controlled zones, and precautionary zones [6]. Due to the rapid increase of COVID cases, outpatient and inpatient clinics of some hospitals closed. With this reduction in healthcare capacity in Shanghai public to access medical support is limited. Connections between doctors and their patients are challenged again. The experience from 2020 prepared doctors to adjust quickly to use online live-stream platforms again to reconnect. Now doctors, health facilities, and their patients are exploring the possibility of expanding e-health in this megacity for greater public health benefit.

Health professionals quickly identified some healthcare-related problems at the start of the 'static management' phase and the online platform played an important role in resolving these issues. Patients with chronic diseases that require regular visits to clinics and pharmacies have not been able to leave their places of residence. Maintaining the accessibility of medication for these patients is a top priority. The medical community created more flexible platforms for remote communication between patients and doctors. Patients under isolation can get a prescription from the doctor online, without leaving home. Community volunteers deliver medications to patients' door without contact (Fig. 1). Although efficiency could be compromised





Fig. 1 Community volunteer deliver the medications to the doors of the patients without contact

by time needed to complete delivery, medication reaches patients without risk of infection.

Another application of e-health today benefits some people under isolation who experience a great amount of mental pressure due to the unpredictability of their lives and future. Healthcare professionals send encouraging messages to reduce anxiety and stress during this challenging time, as educational live-stream events continue. The contents are educational for the public relating health advice for daily use, reinforcing the importance of personal hygiene during the pandemic.

This pandemic has a silver lining: it has catalysed use of online platforms and e-health to ensure a continuation of healthcare for vulnerable groups. During the



pandemic, both the healthcare professionals and the general public have seen the benefit of technology in healthcare. People have learned to adapt these emerging technologies and built infrastructure for e-health. All these elements provide an impressive foundation for the development of more comprehensive e-health in the future [7]. The potential of e-health is massive [8], especially in a country like China with such a large population. We hope e-health will be more than a tool used during a pandemic—that it will become a routine part of healthcare in China.

Funding Fund for Scientific and Technological Innovation of Shanghai Jiaotong University (YG2021QN141) and Shanghai Natural Science Foundation (22ZR1480800).

Declarations

Conflict of interest All authors declare no conflict of interest.

References

1. Chen J, Wang R, Gilby NB, Wei GW. Omicron (B.1.1.529): Infectivity, vaccine breakthrough, and antibody resistance. *J Chem Inf Model.* 2021.
2. Gao SJ, Guo H, Luo G. Omicron variant (B.1.1.529) of SARS-CoV-2, a global urgent public health alert! *J Med Virol.* 2022;94(4):1255–6.
3. Zhu M. Publicatino of the main data of the seventh national census in Shanghai: Shanghai Municipal Bureau of Statistics; 2021. <http://tjj.sh.gov.cn/tjxw/20210517/4254aba799c840d2a54f9ef82858bcf5.html>.
4. Rahman S, Singh K, Dhingra S, Charan J, Sharma P, Islam S, et al. The double burden of the COVID-19 pandemic and polypharmacy on geriatric population—public health implications. *Ther Clin Risk Manag.* 2020;16:1007–22.
5. Zhang X, Zhang W, Chen S. Shanghai's life-saving efforts against the current omicron wave of the COVID-19 pandemic. *Lancet.* 2022.
6. Zhou W. Shanghai introduces zones to ease restrictions: China Daily. 2022. http://www.chinadaily.com.cn/m/shanghai/jiading/2022-04/12/content_37550471.htm.
7. Budd J, Miller BS, Manning EM, Lampos V, Zhuang M, Edelstein M, et al. Digital technologies in the public-health response to COVID-19. *Nat Med.* 2020;26(8):1183–92.
8. Garfan S, Alamooodi AH, Zaidan BB, Al-Zobbi M, Hamid RA, Alwan JK, et al. Telehealth utilization during the COVID-19 pandemic: a systematic review. *Comput Biol Med.* 2021;138: 104878.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

