Digital Transformation of Healthcare and Medical Education, Within, and Beyond Pandemic COVID-19

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Abstract

Digital transformation during the pandemic COVID-19 has been impressive. Some organizations have accelerated the adoption of new technology and digitalization as their response to the pandemic COVID-19. The healthcare and medical education systems are also not left behind in adapting to new digital solutions. Examples include e-health and virtual consultations, management of big data and application of artificial intelligence, and the Internet of Things. The response in education includes remote learning and using educational technologies to empower medical graduate teaching. New ways of work using technologies and digital solutions not only beneficial within the unprecedented crisis but shine a light towards greater digital adoption beyond the pandemic COVID-19.

Keywords: digital transformation, e-health, healthcare, medical education, pandemic COVID-19

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The World Health Organization (WHO) has declared the novel coronavirus disease...
2019 (COVID-19) outbreak as a new pandemic on 11 March 2020 [1]. The virus spread between people via direct, indirect (through contaminated surfaces or objects), or close contact with infected people (through nose and mouth secretions) [2]. This pandemic has led to unprecedented disruptions to society, economy, education, and the healthcare system. The ease of transmission of the virus and the need for physical distancing has contributed to the rapid rise of digital transformation in healthcare management and continuous medical education.

Many countries have catalyzed the rapid adoption of telehealth and shift towards telephone and video consultations to overcome the challenges during this pandemic [3]. The terms telemedicine and telehealth are frequently interchangeably. As defined by the World Health Organization, telehealth is a broad range of technologies and services to support long-distance healthcare [4]. Telehealth is a subset of e-health, which refers to the entire spectrum of the delivery of health information for both healthcare professionals and consumers, and non-clinical services such as organizational meeting, provider training, and continuous medical education via telecommunications and internet. Telemedicine is a subset of telehealth, which involves assessment, diagnosis, treatment, and monitoring.

Telehealth has been rising during the pandemic COVID-19, yet the change was slow before. It has direct and indirect roles in minimizing the spread of infections by enabling physical distancing, tracking the outbreaks, and plays a vital role in anticipating needs and deciding appropriate interventions by policymakers [5]. Telehealth can take place synchronously (video and telephone), asynchronously (e-consults and patient portal messages), via virtual agents (chatbots), and wearable devices [6]. With the movement control order and physical distancing measures, telehealth sustains the continuity of outpatient patient care, patient with chronic diseases, and follow-up. It helps balance the supply of healthcare services with a surge in demand for physical and geographical boundaries and conserve personal protective equipment.

Early adopters of virtual primary care have traditionally been remote communities with limited access to primary care providers. The telehealth platform must be easy to use and manage, affordability for the healthcare providers, and individuals, which might require a strategic business model. For sustainability and long-term benefits of telehealth, healthcare providers need to collaborate and learn which models work well, when, where, and how to deliver in the best way. The government needs to support the e-health industry in developing and provide local guidelines that are simultaneously safe, feasible, and protect both healthcare staff and patients [5]. Providers need to collaborate with professionals and patients to ensure data security, digital inclusion, and solutions that are custom-fit to users' needs. With coronavirus requiring isolation, and some residents already take up self-isolation, it will foresee that patient demand for remote consultations and virtual healthcare services will increase.

However, we must remember that many medical conditions require thorough assessment includes physical examinations, and this requires the human touch. To date, there are insufficient technologies to work with clinicians to overcome these challenges. Big technology companies might invest to develops digital health innovation to suit clinicians and caregivers, health systems, insurance companies, and patients. The COVID-19 pandemic opened a real opportunity in developing artificial intelligence for better healthcare solutions, accelerated digital literacy among clinicians, caretakers, and patients.

Digital technologies not only help within this containment period but during recovery
and beyond the pandemic COVID-19. Readily available digital technologies can aid a society get back on its feet by permitting people to share experiences and resource information. Artificial intelligence (AI) is applied to manage this large quantity of data. Big data and the Internet of Things are hugely advance to manage recordkeeping in the health care industry. With AI advancement, all of these data management can be inserted into algorithms for machine learning to predicting analysis reports in healthcare. Thus, AI has the potential to enhance the quality of care through unique workflows and decreased medical errors [7].

The current pandemic not only disrupts the healthcare system and patient but had deliberate implications for the educational institutions, particularly medical schools. Movement control orders by government and local authorities made traditional learning face-to-face scarcer. As learning institutions across the world temporarily close their doors due to the COVID-19 pandemic, educators are turning to remote learning as a way to keep their students engaged. Remote learning compassed synchronously or asynchronously. It can be delivered via various platforms using the internet and technology, such as a printed book, radio, television, and thumb drive, but without the traditional classroom face-to-face interactions. As learning institutions across the world temporarily close their doors due to the COVID-19 pandemic, educators are turning to remote learning as a way to keep their students engaged. Remote learning compassed synchronously or asynchronously. It can be delivered via various platforms using the internet and technology, such as a printed book, radio, television, and thumb drive, but without the traditional classroom face-to-face interactions. Previously we are advocated with blended learning; online learning (any forms of learning via the internet) combine with the conventional classroom face-to-face interactions. Blended learning is not a new concept, with various platforms providing different learning materials, such as Moodle learning management systems (LMS) and massive open online courses (MOOC).

Despite the disruptions, there are always silver linings. COVID-19 pandemic grants a real opportunity for the advancement of digital transformation in healthcare and education within and beyond the pandemic age.

Recently we have experienced a rise in videoconferences worldwide, using a platform such as Zoom (https://zoom.us) and Cisco Webex (https://webex.com). There are innovative trainers include peer-to-peer trainers conduct courses for better teaching and learning experiences virtually. There is evidence that video conferences are comparable to traditional face-to-face education [8]. The advantages of long-distance learning, everyone has valuable opportunities to learn anywhere from around the global, and from national and international experts. We hope these trends will persist beyond a pandemic, increasing resources available worldwide and reduce the cost and time for traveling.

However, certain aspects of medical education cannot replace virtually; human touch and procedural skills. We need to ensure the medical students are clinically competent. So during the outbreak, we facilitate the practical skills and clinical procedures supplemented by simulation and technologies such as augmented or virtual reality with haptic resonance technology [9]. We also encouraged them to reflect on what they have learned during the crisis. It might be worthwhile beyond a pandemic to maximize the benefits of blended learning, the combination of online and offline teaching methods. The model basis of digital learning materials, learning objectives, and students’ preferences and attributes should be accessed to achieve greater effectiveness of online learning [8].

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