

Navigating the challenges in remote medical care for mariners during disasters and pandemics: integration of mHealth and drone technology

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INTRODUCTION

Mariners work in remote areas with limited access to medical facilities, which creates unique challenges in accessing medical care. The integration of mobile health (mHealth) and drone technology presents a promising solution that can offer remote medical consultation, monitoring, and digital intervention services to mariners. Furthermore, drones can be used to provide timely transportation of medical supplies and equipment to the ships, especially during emergencies. However, the implementation of mHealth and drone technology for mariners' health also presents challenges, such as connectivity issues, regulations, safety, weather conditions, and privacy and security concerns related to medical data. This research work addresses the potential benefits and challenges as well as implications of integrating m-health and drone technology for mariners' health.

In the last two decades, approximately eight thousand distinct disasters and catastrophic events have been recorded. Each disaster has an immense impact on the physical, cognitive and emotional health of individuals, especially seafarers and mariners [1]. The scary and horrific situation of the disaster generally induces different kinds of infections such as hepatitis, typhoid, diarrhoea, acute respiratory infections, malaria, leptospirosis, and measles [2]. In the critical situation of the disaster (hydro-meteorological, geo-morphological, and geophysical disasters), the on-time support provided through mHealth and drone technology can surely mitigate the risk of infections and can save masses of human lives. As per prior studies, the case mortality rates (CMR) of different pandemics, H1N1, H5N1, Ebola, Middle East respiratory syndrome coronavirus (MERS-CoV), and severe acute respiratory syndrome coronavirus (SARS-CoV) strain,

were 3%, 60%, 50%, 34%, and 15%, respectively. However, to date, the CMR for coronavirus disease 2029 (COVID-19) is 2.16% which is quite lower than H5N1, Ebola, MERS-CoV, and SARS-CoV [3].

IMPLICATIONS OF MHEALTH

The mHealth services are proven to benefit in self-diagnosis, treatment, remote monitoring, telemedicine, and chronic illness. Over the next 10 years (2021-2030), the current value of the mHealth industry is anticipated to rise at a 30 per cent compound annual growth rate. It has been perceived that in the coming years, the key services (remote monitoring and patient tracking services) of mobile apps will surely assist in accomplishing a lucrative growth [4]. The health-related data (temperature, blood pressure, saturation rate, heart rate etc.) captured through m-health apps can be examined to reveal the physical and mental state of the victims. The mHealth services have the potential to reinforce communication and health management services for victims of disasters and outbreaks. These services offer a cost-effective, paperless, and rapid action to deal with disaster management. The mHealth services can be utilized to offer digital intervention to ameliorate the physical and psychological impact of the disaster which would subsequently hold back the triggering effect of the disastrous conditions and helps in reducing the number and intensity of infections [5]. The mHealth services can also be utilized to educate and train the victims to make them healthy and safe during disaster and pandemics.

IMPLICATIONS OF UAV

The disaster or pandemic conditions offers a real opportunity to use these robotic unmanned aerial vehicle (UAV)

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Received: 6.03.2023 Accepted: 29.06.2023

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to control the rate of infection during pandemic and disasters [6]. These drones have the potential to provide daily needs and emergency healthcare (drugs and medication) support. During catastrophes, the contactless delivery of drone found to be more productive in averting mass infectious diseases and their consequences. In case of emergency and to save human lives, these UAVs can quickly transport the critical medical kits to the disaster-afflicted areas. Moreover, the on-time support of UAVs help in reducing the infection and mortality rate of the disaster. The UAVs found to be productive in controlling and mitigating the COVID-19 infection rate by providing rapid and reliable services for sample collection and disbursing the vaccination in the remote and slummy areas.

To summarize, the hybridization of mHealth and drone technology both found to be an optimal solution in case of disaster and pandemic situations. The use of mHealth services assists in giving the medical prescription and remote digital intervention; whereas, UAVs helps in delivering the right and fast medical kits to control the rate of infection and their consequences. UAVs can also be used as a surveillance tool to locate and control the social distancing in the hot-spot areas. Along with vaccination, the use of m-health and drone technology seems to be the key reasons behind the low CMR of COVID-19.

CHALLENGES FOR MHEALTH AND DRONE TECHNOLOGY

The safety, power, autonomy, legislation, air traffic, poor climate conditions, privacy and security are the sole challenges in the deployment of drone technology. As power plays an important role in the overall functioning of the UAVs; therefore, it needs to be optimized. Likewise, the usability, network (access, bandwidth, fluctuation, reliability), data (security, privacy) and the integration of the mHealth framework with the Internet of Things are the challenging areas for the implementation of these services [7]. Despite this, individuals need to be aware of the usage and the potential implications of mHealth and medical drones. Above all, to get the productive results of mobile and drone health services, the issues regarding the mistrust of technology has to be successfully resolved.

The integration of mHealth and drone technology offers a promising solution for providing remote medical services to mariners and disaster victims. This technology can provide medical consultation, monitoring, and intervention services to individuals working in remote areas with limited access to medical facilities. It can also facilitate the transportation of medical supplies and equipment during emergencies. However, the successful implementation of these technologies faces challenges such as connectivity, safety, regulatory frameworks, weather conditions, and privacy and security issues. Overcoming these challenges and promoting awareness about these technologies is essential for their effective utilisation. Ultimately, the deployment of mHealth and drone technology can mitigate the risk of infections and save countless human lives, making it a valuable solution for the health and well-being of individuals in disaster-prone areas.

Conflict of interest: None declared

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