

The role of digital health in revolutionizing healthcare delivery and improving health outcomes in conflict zones

DIGITAL HEALTH
Volume 9: 1–3
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DOI: 10.1177/20552076231218158
journals.sagepub.com/home/dhj



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Abstract

The provision and planning for healthcare delivery in conflict is a pressing imperative. Healthcare within these environments is naturally complex, given the entanglement of affected populations, militaries and oft-deteriorating public services. The field of digital health, placed at the intersection of healthcare and technology, has the power to revolutionize healthcare delivery and improve health outcomes worldwide. Its impact is particularly significant in conflict zones, where it can address the unique challenges faced by these regions. Violence, damaged infrastructure, restricted mobility, forced migration, and overstretched healthcare facilities are all hallmarks of conflict zones that demand novel approaches to addressing them. Health care delivery is being revolutionized by the introduction of digital health technology in conflict zones, which are improving access, emergency response capacities, health information management, and mental health assistance. Doctors and aid organizations can more easily overcome challenges and reach out to underserved populations in these regions because to digital technological improvements. Recent decades have seen a shift in the nature of conflict, and with it, a corresponding shift in the range of digital health solutions available to address geographical, epidemiological, and clinical gaps. The purpose of this letter is to inquire into the application of digital health in conflict zones and its potential to lessen the pressing healthcare needs of affected communities.

Keywords

Digital health, telemedicine, conflict areas, mental health services, electronic health records

Submission date: 14 June 2023; Acceptance date: 11 November 2023

Dear editor,

Planning and organizing the supply of healthcare in times of crisis is an urgent necessity. It is well established that instability, violence, and persistent insecurity have repercussions for the normal functioning of a health system and the estimation of healthcare burden in impacted areas. Given the intertwined nature of the impacted communities, militaries, and sometimes declining public services, providing healthcare in such settings inevitably becomes challenging. Recent decades have seen a shift in the nature of conflict, and with it, a corresponding shift in the range of digital health solutions available to address geographical, epidemiological, and clinical gaps.^{1,2}

The field of digital health, which lies at the confluence of healthcare and technology, is undergoing rapid development and has the capacity to transform healthcare delivery and enhance health outcomes on a global scale. The impact

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of digital health in conflict zones is particularly significant, showcasing its transformative potential.³ The aforementioned regions, characterized by a prevalence of violent activities, forced migration, and restricted healthcare accessibility, present distinctive obstacles that necessitate the implementation of inventive remedies. This letter aims to explore the use of digital health in areas of conflict and its potential to mitigate the urgent healthcare requirements of impacted communities.

Conflict zones frequently experience impaired infrastructure, limited mobility, and overburdened healthcare facilities.⁴ Digital health innovations present an opportunity to overcome these disparities and furnish individuals with access to healthcare amenities. Telemedicine facilitates remote consultations, thereby enabling healthcare providers to extend their services to patients who face difficulties traveling or accessing physical healthcare facilities. By means of video conferencing or mobile applications, medical practitioners are able to provide diagnosis, prescribe drugs, and furnish assistance to those requiring medical attention, thereby alleviating the strain on healthcare systems that are already overtaxed. Mobile health applications play a crucial role in conflict zones by enabling healthcare providers to extend their reach to patients residing in locations that are otherwise difficult to access, thereby providing essential medical aid. Patients have the ability to obtain immediate medical guidance, avail themselves of educational materials, and arrange virtual appointments with physicians. Furthermore, these applications also facilitate the monitoring of disease outbreaks, so enabling prompt action and mitigating their transmission within displaced communities.

Emergency medical services play a critical role in preserving lives and delivering vital care during times of conflict and crisis. Effective response and coordination are imperative in ensuring the provision of timely and appropriate medical attention. The utilization of digital health tools has been found to enhance emergency response efforts by promoting efficient collaboration among healthcare professionals, relief agencies, and impacted populations. The utilization of Geographic Information Systems (GIS) in conjunction with real-time data sharing facilitates the identification of regions necessitating immediate medical attention and the effective allocation of resources.⁵ This technology facilitates the monitoring of disease outbreaks, tracking the transmission of infectious diseases, and executing focused interventions.

The provision of precise and prompt health-related data is of utmost importance for the efficient delivery of healthcare services and the making of informed decisions in areas affected by armed conflicts. Digital health systems have the capacity to gather, retain, and scrutinize health information, thereby empowering healthcare practitioners to make well-informed judgments and customize interventions to meet individual requirements. Electronic health records (EHRs)

serve to integrate patient data, promoting seamless healthcare delivery even in tumultuous settings. In addition, the implementation of surveillance systems can facilitate the monitoring of disease patterns, the identification of outbreaks, and the provision of guidance for preventive measures, thereby augmenting the overall effectiveness of public health responses.⁶

Psychological support and mental health services are crucial in conflict zones, where affected populations often experience trauma and stress, leading to a rise in psychological disorders. Digital health platforms present a viable solution to cater to these requirements by furnishing psychological assistance and mental health amenities.⁷ The utilization of telepsychiatry facilitates the provision of counseling and therapy sessions from a distance, thereby extending access to mental health care to individuals who may face barriers to seeking in-person treatment. Digital mental health tools, including but not limited to mobile applications and conversational agents, have the potential to provide individuals with self-guided interventions, adaptive coping mechanisms, and confidential assistance, thereby fostering psychological fortitude and enhancing overall wellness in the face of adversity.

Expanding wearable technology and health self-monitoring systems to monitor health-related indicators, as well as supporting tactics like contact tracing and health promotion using portable devices and mobile applications, are examples of disruptive innovations in the digital health industry. Challenges in expanding these technologies and the associated infrastructure, as well as pre-existing issues of privacy and oversight, become more pertinent as the role of portable devices in state surveillance and monitoring systems becomes more visible and contested during the COVID-19 pandemic. To fully reap the benefits of such technologies in a variety of settings, including fragile and conflict-affected zones, more policy-driven work is required to address these valid concerns.^{1,8,9}

The effective implementation of digital health in conflict zones is contingent upon addressing several challenges, despite its significant potential. The adoption of digital health technologies on a large scale is hindered by infrastructure limitations such as inconsistent electricity and restricted internet access.¹⁰ The safeguarding of sensitive health information of individuals in conflict zones is of paramount importance, necessitating the assurance of data privacy and security.¹¹ In addition, the presence of cultural factors, linguistic obstacles, and limited health literacy necessitate the development of digital health interventions that are contextually relevant, inclusive, and easily accessible.

The implementation of digital health technologies in conflict zones is transforming the provision of healthcare services by enhancing accessibility, emergency response capabilities, health information management, and mental health support. Through the utilization of technological

advancements, healthcare practitioners and humanitarian groups can effectively surmount obstacles and provide crucial services to marginalized communities. Sustained investment in infrastructure, data security, and culturally appropriate strategies is imperative for optimizing the efficacy of digital health interventions and establishing enduring healthcare systems in regions affected by conflict. Through continuous advancements and cooperative efforts, digital health has the potential to serve as a crucial factor in preserving human lives, alleviating distress, and fostering adaptability in the face of challenging circumstances such as conflict.

Digital health can supply medical care in conflict despite system damage, health workforce departure, and widespread insecurity. Conflicts in the twenty-first century have provided impressive examples of innovative programs that use digital technology to solve mounting health crises, but there are still glaring problems with ensuring that the benefits of these innovations are shared fairly. A more solid body of evidence in support of the wide implementation of these technologies is necessary. The unique dynamics of conflicts necessitate studies focusing on the integration of technology into health care initiatives. Published research shows extremely imaginative approaches to difficult situations, but they also reflect a heavy workflow and uncertain therapeutic effects. A deeper grasp of the characteristics that make it possible to distribute digital health modalities in conflict zones is necessary to fully appreciate the challenges that come with doing so. Since the proliferation of technology capabilities across contested security environments is expected to cause chronic operational issues, it is crucial that practitioners and policymakers have easy access to data on the effectiveness and cost-effectiveness of these measures.

Acknowledgments: The authors appreciate the editors and the reviewers for their insightful and helpful comments and remarks.

Author contribution: SKA conceived and designed this paper. SKA wrote the manuscript. SKA, SH, DC, MRI and KD revised the manuscript. The author(s) read and approved the final manuscript.

Ethical approvable: Not applicable.

Informed consent: Since the present study did not involve any public or patient, we do not need patient consent.

Declaration of conflicting interests: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding: The authors received no financial support for the research, authorship, and/or publication of this article.

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