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Improving HIV-related care through eHealth

WHO defines electronic health (eHealth) as "the use of information and communication technologies (ICT) for health".[1] eHealth interventions can be effective in HIV care (eg, aiding prevention,[2] retention in care,[3] and treatment adherence).[4]

However, these studies mainly describe the effect of mobile-phone text reminders or web-based information.[5] With new smartphone technology, eHealth interventions can now advance from simple text messaging to the monitoring and tracking of patients and video communication between patients and health-care providers. Furthermore, connection of smartphone applications to the electronic health record and use of artificial intelligence enables patients to take control of their health.[6] These developments could be particularly valuable for people living with HIV.

No cure for HIV exists and effective treatment means lifelong drug therapy requiring high adherence and regular follow-up visits with an array of laboratory tests, largely within HIV centres or primary health-care facilities. Prevalence of multiple clinical comorbidities is high in people with HIV, with concomitant polypharmacy, and as such, these patients have much to gain from effective interdisciplinary care.[7]

To date, eHealth applications have been developed for comorbidities that are particularly common among people with HIV, including diabetes, pulmonary, and cardiovascular diseases. Data from diabetes care, for example, show text messaging to be effective in improving glycaemic control.[8] HIV care is moving beyond the UNAIDS 90-90-90 virological suppression targets to improve the health-related quality of life (HRQoL) of people living with HIV (the fourth 90).[9]

This target can be measured by collecting patient-reported outcomes. Happi is a unique example of an application focusing on HRQoL and comorbidity management, translating individual laboratory values and patient-reported outcomes into health goals shown on a smartphone, including therapy effectiveness and tolerability, cardiovascular risk, and quality of life.

Clearly, pitfalls still need to be considered. eHealth needs to consider the demands of an ageing and ethnically diverse population living with HIV and must minimise health-related and literacy-related disparities in access to eHealth applications.[6]

Furthermore, social barriers within the health-care community might hamper acceptance and widespread use of eHealth.[10] Clinicians are concerned about increased workload, disturbed workflow, and overwhelming data accumulation. Some clinicians fear the remote nature of eHealth-based interactions has the potential to undermine the quality of patient–physician interactions.[10] Concerns have been expressed that eHealth could lead to an over-reliance on technology to monitor health, overinterpretation of algorithm medicine, or excessive use of unproven technology for profit.[10] For example, of more than 325 000 available medical applications available in 2017,[11] few had been reviewed by authorities or expert groups.

Therefore, HIV-related eHealth initiatives must not only address convenience or cost reduction, but also consider the safe implementation of, for example, treatment guidelines to improve HIV care and clinical outcomes. The impact on patient-relevant outcomes of HIV-related eHealth tools will need scientific evaluation.

Another chief area that might hinder large scale use of eHealth initiatives is concerns about security and privacy of (medical) data from both the devices that collect and systems in which data are stored.[6] The Grindr scandal, in which a popular gay dating app was sharing its users' HIV status with other companies, and more recently a leakage of data of 14 200 patients with HIV by a US fraudster are good examples. Although the demand to guarantee safe data storage and access is a general challenge for eHealth and patient's electronic data records, the stigma that continues to surround HIV makes it a particularly sensitive issue.

Pioneering solutions, such as blockchain,[12] a novel technology that features decentralised data storage (ie, there is no single computer storing them) and immutable data (ie, once stored, they cannot be removed or modified), which is used in the Estonian health-care system, might hold promise for HIV care. The new European Medical Device Regulation that will become effective on May 25, 2020 will also enforce specific regulations for data quality and safety.[13]

Other opportunities will arise when adequate political support for implementation of eHealth is ensured, more specifically in promoting a worldwide digital infrastructure. In 2016, a promising 125 member states participated in the third global survey of the WHO Global Observatory for eHealth showing, for example, that remote patient monitoring and teledermatology, are in place in nearly half the countries.[14]

Long-distance care delivery services are of particular importance in low-income and middle-income countries where the complexities of a substantial HIV burden, poor access to health services, inadequate infrastructure, and limited human and financial resources create environments in which these initiatives could be even more powerful.

Communication and computer infrastructure in low-income and middle-income countries are now improving rapidly[15] and mobile phone penetration in sub-Saharan Africa is predicted to reach 50% by the end of 2023.[16] eHealth could support time-efficient quality consultations and communication between people living with HIV and their care providers.[17]

New eHealth technologies will facilitate the remote monitoring of many patients for acute and chronic conditions, which can then be followed up through different methods (text messaging, video conferencing, or live consultations).[6] A drawback is that most eHealth initiatives in African countries are sponsored by international donors, non-governmental organisations, research institutions, and private industries. Many prog-rammes stagnate because of a lack of donor funding and absence of local ownership.[18]

Given the successful scale-up of antiretroviral therapy globally, eHealth applications have the potential to transform HIV care beyond viral suppression in terms of comorbidity management, HRQoL, and patient-reported outcomes. We recommend that stakeholders in HIV medicine and eHealth strengthen their collaboration for achieving the triple aim of improving the experience of care from an individual perspective, improving the health of the population, and reducing the cost of care per capita.[19] Implementing what has already been shown to work,[3,4] alongside new eHealth applications and interventions, has the potential to move us further and faster both to reach UNAIDS 95-95-95 targets for 2030 and to ensure that people living with HIV live long and live well.

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