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EDITORIAL COMMENT

Digital cardiovascular healthcare: Current state and future perspectives

Saúde digital cardiovascular – o seu estado atual e perspetivas futuras

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According to the current European Union definition, digital health (DH) refers to tools and services that use information and communication technologies to improve prevention, diagnosis, treatment, monitoring and management of health-related issues and to monitor and manage lifestyle-habits that impact health.[1] It encompasses a wide range of technologies, including mobile health apps, wearable devices, telemedicine, electronic medical records, health information systems, and various other digital tools and platforms.

It has been stated that innovation in health technology is one of the most promising improvements to be applied to the Portuguese national health system.[2] When implemented in practice, digital technology has been shown to lead to improvements in morbidity and mortality outcomes in patients with cardiovascular disease (CVD).[3,4] It also increases patients' confidence, empowerment and satisfaction regarding their healthcare team, and simultaneously enables systematic savings in a financially burdened system[5] – thus directly helping healthcare systems, practitioners and patients to actually improve their outcomes.[6]

To apply DH at the national level, healthcare practitioners (HCPs) need to be engaged; however, the position of Portuguese HCPs regarding current DH implementation had never been assessed until now. The work by Queiroz et al. published in this issue of the *Journal*[7] applied a survey to provide a snapshot of DH use in the routine practice of Portuguese cardiovascular HCPs and the barriers they perceive against its widespread implementation. They sent a Google Forms questionnaire via the Portuguese Society of Cardiology's mailing list to 1174 potential respondents, including doctors, nurses, technicians, and researchers. They achieved a 10% response rate; thus, non-response bias cannot be ignored. However, the results were clear: most cardiovascular HCPs know what DH is and have positive expectations regarding its future in CVD management.[7]

According to their survey, this population of cardiovascular HCPs think that the main limitation for DH adoption is limited access to electronic devices and patients' inability to use smartphones. However, it should be borne in mind that most respondents were not involved in any DH program – and if we take non-response bias into account, these are probably the most digitally-driven cardiovascular HCPs in the country. This highlights one of the major obstacles to DH implementation: the majority of HCPs know its potential but are not engaged in its further advancement. The authors discuss this briefly, mentioning a lack of investment

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in the field,[8] and point out that it is imperative to establish preparedness at leadership, systemic, and individual levels to harness the benefits and optimize investments associated with DH.[7] To overcome these obstacles, awareness must be the first step: to further expand DH implementation, it is essential to understand how it can actually impact daily clinical practice. The scientific literature, medical meetings and social media have an important role in this regard, and cardiovascular HCPs need to take on a leading role in this area.[9] CVD is the leading cause of death worldwide, and in most cases is accelerated by largely modifiable behavioral and metabolic risk factors; the weight of scientific evidence supports the use of digital technologies to address this topic.[3]

Curiously, despite being one of the DH tools with most published studies demonstrating their efficacy, in Queiroz et al.'s study smartwatches were considered one of the least important technologies for healthcare. This is explained by the authors as resulting from a certain fear of the unknown and doubts regarding the potential of new tools.[7] This 'black-box effect' – not knowing how a consumer-driven product can identify specific cardiac events – can be avoided with more awareness about the way wearable technology and artificial intelligence work. Also, forthcoming trials demonstrating the clinical impact of smartwatch use, such as the Heartline study,[10] are eagerly anticipated.

Going beyond simply using electronic medical records as a standard source of data, healthcare systems can rapidly evolve to a level of interoperability that will enable them to seamlessly incorporate information from different structures and data types, creating clinical decision support systems that allow time-saving and cost-effective measures that lead to better healthcare.[2–4] This should be an ultimate society-level goal, so more investment regarding DH implementation at the national level is needed, preferably involving cardiovascular HCPs in its development; Queiroz et al.'s article shows that cardiovascular HCPs have, in general, a positive attitude toward DH. As stated by the authors, the path forward should be focused on the promotion of a patient-centered and clinically pertinent DH tool development pipeline, alongside the dissemination of scientific updates and medical education of the public. All these goals merit consideration as an integral part of this ongoing technological revolution.

Conflicts of interest

The authors have no conflicts of interest to declare.

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