JACC: ADVANCES VOL. 2, NO. 7, 2023

EDITORIAL COMMENT

Inclusive Health Tracking

Unlock the True Potential of Digital Health Solutions*

Mark J. Schuuring, MD, PhD,[a,b,c] Jelle P. Man, MSc,[a,c] Steven A.J. Chamuleau, MD, PhD[a,c]

Smart devices such as smartphones and smartwatches are increasingly used for digital health solutions to manage diseases and track health goals.[1] The expansion of digital health solutions and the number of vendors emerged particularly during the COVID-19 pandemic.[2-4] Benefit of these solutions is often expected through increased health awareness, patient engagement, or early diagnosis and detection of disease deterioration. Presently there are no concrete guidelines from the American College of Cardiology, American Heart Association, or European Society of Cardiology on how to use, interpret or act on information from digital health solutions. Before adoption to routine clinical practice, 3 important steps should be made (see **Figure 1**): 1) general availability of digital health solutions for everybody; 2) supported and sustained use; and 3) evidence of its impact on clinical outcome and quality of life. The paper of Aminorroaya et al[5] in this issue of *JACC: Advances* describes an important observation in view of the first step of general implementation of digital health solutions.

STEP 1: PATTERNS OF USE OF DIGITAL HEALTH SOLUTIONS

It is imperative to understand the uptake patterns of digital health solutions to enable the application of novel technologies in routine health care, because the current use patterns reveal the gaps and the readiness of the population to adopt these solutions. Aminorroaya et al[5] performed a cross-sectional study using self-reported tracking of health-related goals using the Health Information National Trends Survey for 2017 to 2020. Health Information National Trends Survey is a long standing national project with extensive output for many years. The strength lies in the number of participants studied. The authors concluded that only 2 in 5 adults (~40%) living in the United States with or at risk of cardiovascular disease used a digital health solution to track health goals. These health goals included optimizing body weight, increasing physical activity, and/or quitting smoking. Cardiovascular risk factors included hypertension, diabetes, obesity, and/or smoking. Importantly, Aminorroaya et al has studied the characteristics of the participants that used the solutions. Now we know that in this large study, participants with a younger age, female sex, Black race, higher educational attainment, and greater income more often used digital health solutions. This indicates that digital health solutions are not widely adopted throughout the community, with the consequent risk of undesired disparity in health care. To prevent disparities, digital health solutions should also be available and designed for groups that currently were related with minimal use, such as older people as well as those with lower educational attainment and income. In fact, these groups are at higher risk of cardiovascular disease. Interestingly, among those participants who already possess a device suitable for a digital health solution, an estimated 58% did not use their devices to track their cardiovascular health goals. Additional studies are needed to evaluate this group.

STEP 2: SUPPORTED TRACKING

Aminorroaya et al[5] have helped provide important information that can then be used to drive

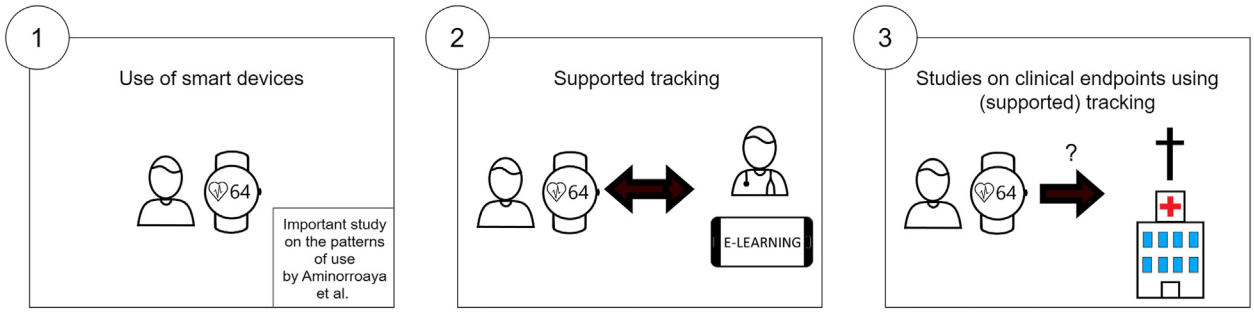
*Editorials published in *JACC: Advances* reflect the views of the authors and do not necessarily represent the views of *JACC: Advances* or the American College of Cardiology.

From the [a]Department of Cardiology, Amsterdam University Medical Centers, Amsterdam, the Netherlands; [b]Department of Cardiology, University Medical Center Utrecht, Utrecht, the Netherlands; and the [c]Amsterdam Cardiovascular Sciences, Amsterdam, the Netherlands.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

ISSN 2772-963X https://doi.org/10.1016/j.jacadv.2023.100545

FIGURE 1 **Sequential Steps for a Successful Deployment of Digital Health Solutions**



implementation. For those sequential steps, however, additional questions remain to be answered. It must be clear how the digital health solutions are used. The intensity of use is important, and whether its use is successful. Evidence of efficacy of digital solutions is emerging[6] and findings are consistent[7,8]; however, some authors have reported only modest impact.[9] It must clear whether users receive bonuses or reminders to achieve goals. The use of the solutions over time have also to be clear. If a health goal is achieved, is there also a sustained benefit over the course of months to years? Tracking is often started enthusiastically, but staying motivated remains a challenge.[10]

It is useful to build in some form of support for the participants. There can be support via education, but preferably with coaching or even under medical supervision. Consequently, in case of suboptimal (or no) use of the digital health solutions, interventions can be proposed.[11]

STEP 3: CLINICAL ENDPOINT STUDIES

The last and most important step is to investigate digital health solutions for direct clinical benefit. This can be done, for example, by comparing the current gold standard of a treatment, added with an innovative digital health solution.[12] Direct clinical benefit will unlock the true potential of digital health solutions.

In summary, now that uptake patterns are described by Aminorroaya et al,[5] we can improve the development of digital health solutions for a more widespread adoption and test the direct clinical benefit of these solutions. Importantly, we should prevent that existing health disparities are further exacerbated. If all stakeholders are involved, such as patients, health care providers and insurance companies, it must be possible to increase the correct use of digital health solutions across the wide diversity of our population. In such way, we can truly move via inclusive digital health tracking to improve care, thereby unlocking its true potential.

FUNDING SUPPORT AND AUTHOR DISCLOSURES

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

ADDRESS FOR CORRESPONDENCE: Dr Mark J. Schuuring, Department of Cardiology, UMC Utrecht, Postbus 85500, Utrecht 3508 GA, the Netherlands. E-mail: m.j.schuuring-19@umcutrecht.nl.

REFERENCES

1. Jensen MT, Treskes RW, Caiani EG, et al. ESC Working Group on e-cardiology position paper: use of commercially available wearable technology for heart rate and activity tracking in primary and secondary cardiovascular prevention—in collaboration with the European Heart Rhythm Association, European Association of Preventive Cardiology, Association of Cardiovascular Nursing and Allied Professionals, Patient Forum, and the Digital Health Committee. *Eur Heart J Digit Health*. 2021;2:49-59.

2. Krishnaswami A, Beavers C, Dorsch MP, et al. Gerotechnology for older adults with cardiovascular diseases: JACC state-of-the-art review. *J Am Coll Cardiol*. 2020;76:2650-2670.

3. Schuuring MJ, Kauw D, Bouma BJ. COVID-19 pandemic: practical considerations on rapid initiation of remote care in chronic cardiac patients. *Eur Heart J Digit Health*. 2020;1:8-9.

4. Barsom EZ, Meijer HAW, Blom J, Schuuring MJ, Bemelman WA, Schijven MP. Emergency upscaling of video consultation during the COVID-19 pandemic: contrasting user experience with data insights from the electronic health record in a large academic hospital. *Int J Med Inform*. 2021;150:104463.

5. Aminorroaya A, Dhingra LS, Nargesi AA, Oikonomou EK, Krumholz HM, Khera R. Use of smart devices to track cardiovascular health goals in the United States. *JACC: Adv*. 2023;2:100544.

6. Piette JD, List J, Rana GK, Townsend W, Striplin D, Heisler M. Mobile health devices as tools for worldwide cardiovascular risk reduction and disease management. *Circulation*. 2015;132:2012–2027.

7. Kitsiou S, Paré G, Jaana M, Gerber B. Effectiveness of mHealth interventions for patients with diabetes: an overview of systematic reviews. *PLoS One*. 2017;12:e0173160.

8. Siopis G, Moschonis G, Eweka E, et al. Effectiveness, reach, uptake, and feasibility of digital health interventions for adults with hypertension: a systematic review and meta-analysis of randomised controlled trials. *Lancet Digit Health*. 2023;5:e144–e159.

9. Shariful Islam SM, Farmer AJ, Bobrow K, et al. Mobile phone text-messaging interventions aimed to prevent cardiovascular diseases (Text2PreventCVD): systematic review and individual patient data meta-analysis. *Open Heart*. 2019;6:e001017.

10. Rasche P, Schlomann A, Mertens A. Who is still playing Pokémon go? A web-based survey. *JMIR Serious Games*. 2017;5:e7.

11. Noah B, Keller MS, Mosadeghi S, et al. Impact of remote patient monitoring on clinical outcomes: an updated meta-analysis of randomized controlled trials. *Nature*. 2018;1:20172.

12. Koole MA, Kauw D, Kooiman KM, et al. An implantable loop recorder or smartphone based single-lead electrocardiogram to detect arrhythmia in adults with congenital heart disease? *Front Cardiovasc Med*. 2022;9:1099014.

KEY WORDS **cardiovascular diseases, health disparity, healthy lifestyle, smartphone, telemedicine**