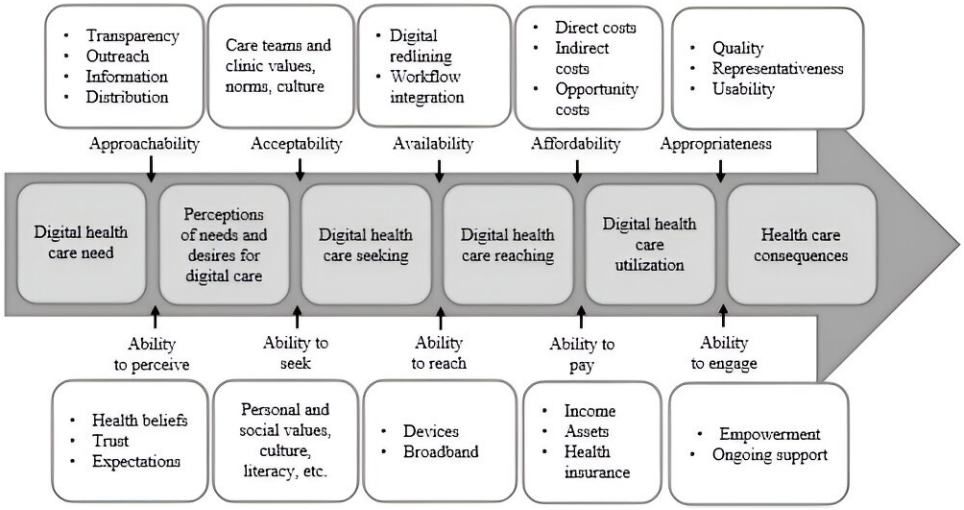
Medical Xpress

Study offers strategies to ensure equitable access to digital health tools

September 11 2024, by Deb Parker



A conceptual framework of drivers of inequitable access to digital health. Adapted from the health care access framework by Levesque et al. Credit: *Journal of Medical Internet Research* (2024). DOI: 10.2196/51355

As digital health tools grow in popularity due to rapid technological advancements and the shift toward personalized medicine, a new study highlights the critical need to focus on equity in their design.

Today's digital health tools are transforming care: wearable devices offer continuous monitoring and early warnings; telemedicine provides virtual consultations, especially in underserved areas; artificial intelligence-

driven interventions support mental health where stigma or access is an issue; and community-based platforms link users to local resources such as food, housing and transportation. Integrated with electronic health records, these tools are becoming more advanced, promising to improve outcomes, streamline care and close health gaps.

The study's senior author, Maura Kepper, an assistant professor within the Prevention Research Center at the Brown School at Washington University in St. Louis, is working to ensure that these innovations serve all populations effectively, particularly the historically marginalized.

The paper, "How to Design Equitable Digital Health Tools," recently published in *PLOS Digital Health*, highlights design tactics, case studies and opportunities for improvement. It provides a roadmap for developers, offering strategies to make future digital health tools accessible, effective and equitable for all.

"Digital health tools have the potential to revolutionize health care," Kepper said. "However, if we don't design these tools with equity in mind, we risk widening the very disparities we aim to reduce." She emphasizes that while the COVID-19 pandemic accelerated the adoption of remote health solutions, many tools lack the necessary design components to equitably serve diverse populations.

Addressing these challenges requires a comprehensive approach that considers individual factors such as race and socioeconomic status as well as structural factors in communities. Kepper's research explores the complex interplay between access and trust. For example, rural populations often lack broadband access, limiting their ability to engage with telemedicine platforms.

At the same time, marginalized communities, particularly African American individuals, frequently express concerns about data privacy

and the trustworthiness of digital tools, reducing their engagement. Without sufficient access and trust in these tools, patients may be unaware of or unable to use the digital health solutions designed to improve care.

Developers must account for multilingual support and different literacy levels to make tools accessible to non-native speakers and those with varying health literacy. These tools also should work on low-cost devices and with slower internet connections. While most people have mobile phones, not everyone has a computer or high-speed internet, Kepper said.

Designing for impact

Kepper's work advocates for digital health tools that go beyond initial access, focusing on long-term sustainability. The final product must be approachable, enjoyable and accessible.

"Many tools are used briefly and then abandoned," Kepper explained. "It's essential to design with sustainability in mind—ensuring that these tools can be integrated into, and add value to, both clinical and community settings for lasting impact." Kepper led the development of a publicly available website, the D4DS Planner, for researchers to learn about and apply methods that can help their products and technologies have broad reach and lasting impact.

The paper was written by a Society for Behavioral Medicine (SBM) working group that Kepper leads. The membership, focused on digital health equity and implementation, includes people working in the technology industry and academics who are digital health experts.

Technique	Description
Participatory Design [60]	A designer-led process using participatory processes such as co-design workshops and interviews to elicit experience insights and product requirements from end users.
Action Design Research [61,62]	Enlists community members as direct design collaborators on the strength of their lived experience; characterized by iterative planning and action cycles with participating community members.
Asset-Based Community Development [63]	Empowers community members to drive solutions by identifying and making use of existing but unrecognized or under-used assets such as individuals, institutions, place-based assets, or relationships.
Service Learning [64,65]	Pairs designers with community organizations for mutual benefit; designers work alongside and learn from community experts and context, and have structured opportunities to channel learnings into design outputs.
Stakeholder-Driven Design [66]	Incorporates insights from community members, leaders, and other influencers to understand the problem space and design adequate solutions.
Collaborative Prototyping [67,68]	Solicits feedback from community members on product prototypes or existing products to refine and iterate the designs.

https://doi.org/10.1371/journal.pdig.0000591.t002

An overview of several community collaboration design techniques that can be used to improve health equity. Credit: *PLOS Digital Health* (2024). DOI: 10.1371/journal.pdig.0000591

Creating positive health interventions has become a passion for Kepper, who has spent the past six years developing her own digital health tool called PREVENT. The tool, now in a trial in rural Missouri, helps health-care teams deliver personalized behavior change counseling for patients who are overweight or obese, using electronic health records to tailor advice and track progress.

"This isn't just about telling people to exercise more," she said. "It's about providing targeted, ongoing support that resonates with the individual's unique situation."

As an implementation scientist, Kepper also frequently serves as a grant co-investigator on digital tools in development at WashU.

The paper, which draws on the working group's combined expertise, calls for standardized practices in the design and evaluation of these innovations. The review points to successful methodologies such as the Double Diamond Model and IDEAS framework, focusing on the importance of participatory design and collaboration with underserved communities.

Reflexive listening

A one-size-fits-all approach often fails to account for the personal and technological factors that influence engagement and outcomes.

"To create effective health tools, we must secure user buy-in from the start," Kepper said. "Designing a solution for a problem we find important is futile if the end user doesn't see its value or find it engaging. Bringing end users in as co-designers is essential, but it's not enough to just include them. We need to engage them in ways that promote true equity."

She stresses the importance of reflexive listening and inclusivity, ensuring that diverse voices shape the solution before any decisions are made.

Kepper acknowledges that while human-centered design has been used in other fields for years, it's only now gaining momentum in health care. Historically, health-care design often focused on clinical and operational efficiency rather than the end user's experience. In health care, the concept has become increasingly important as the industry shifts toward more personalized approaches.

Equitable design standards still are being determined in this burgeoning field, but the most successful tools will be those that seek robust input from all constituents, Kepper said.

"Academics often are focused on whether the digital innovation is rigorous, in terms of the content. Industry comes in and designs these tools that are really jazzy, fun and approachable, and so we really need to work together and use both of those approaches to ultimately generate widespread use and benefit from digital health. To maximize the impact of digital health, we need to combine these strengths, involving diverse stakeholders—patients, physicians, hospital leadership and policymakers—in the design process," Kepper added.

The SBM digital health equity working group also wrote a related paper, "Expanding a Behavioral View on Digital Health Access: Drivers and Strategies to Promote Equity," recently published in the *Journal of Medical Internet Research*. Kepper is first author and Lisa M. Klesges, a professor of surgery at WashU Medicine, is senior author.

More information: Amy Bucher et al, How to design equitable digital health tools: A narrative review of design tactics, case studies, and opportunities, *PLOS Digital Health* (2024). DOI: 10.1371/journal.pdig.0000591

Maura M Kepper et al, Expanding a Behavioral View on Digital Health Access: Drivers and Strategies to Promote Equity, *Journal of Medical Internet Research* (2024). DOI: 10.2196/51355

Provided by Washington University in St. Louis