2021

Implementation science and digital health interventions workshop

A summary of presentations and discussions

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GACD

GLOBAL ALLIANCE FOR CHRONIC DISEASES
AN ALLIANCE OF HEALTH RESEARCH FUNDERS

An output from the Global Alliance for Chronic Diseases Research Network

Implementation science and digital health interventions workshop

Why digital health interventions?

Advancements in technology and communications offer great opportunities to bridge knowledge-practice gaps in global health. Many care packages and pathways were adapted for online or mobile delivery with impressive speed during the coronavirus pandemic, hastening the progress of healthcare in the digital sphere.

The World Health Organization says:

"The use and scale up of digital health solutions can revolutionize how people worldwide achieve higher standards of health, and access services to promote and protect their health and well-being.

"Digital health provides opportunities to accelerate our progress in attaining health and well-being related Sustainable Development Goals (SDGs), especially SDG 3."

On Wednesday 7 July 2021, GACD hosted a workshop to explore opportunities and challenges of digital health interventions for non-communicable disease prevention and management in low- and middle-income countries and vulnerable populations in high-income countries.

Known barriers to implementation

Josefien van Olmen (University of Antwerp) presented findings from a scoping review of implementation barriers for mHealth interventions addressing NCDs in low- and middle-income countries.

NCD-related barriers
Age, complications, disease progression, NCD prevalence among older people and those with lower socio-economic status associated with lower digital literacy, stigma

Mobile intervention barriers
Translation of personal motivational coaching to a mobile app (content, stratification, timing)

Technical barriers
Network provider, operating systems, hardware, software, links between digital systems, adaptation of the intervention requiring change to technical architecture, separation from existing health management information system

Health care service barriers
Lack of resources, access to care, integration of mHealth into existing processes

Contextual barriers
Security, gender differences, social, economic, and cultural factors, access to devices, perceptions of tracking software

Regulatory barriers
Lack of clarity on digital health regulations in many countries, reverse billing must allow for special short codes, bulk messaging led to intervention messages identified as 'spam' on end-user devices

Read more: van Olmen J et al. (2020) Wellcome Open Res. 16;5:7. pubmed.ncbi.nlm.nih.gov/32399497/

Lessons learned

We invited four researchers to share what they learned through implementing a digital health intervention in different settings; below is a summary of their advice to projects just starting out.

The DMagic Trial

Abdul Kuddus (Diabetic Association of Bangladesh)

Exposure to and engagement with voice-based SMS can be optimised by:

- Sending identifiable messages from a trusted source.
- Increasing population participation in the design of mHealth interventions.
- Implementing as part of a multi-component, multi-sectoral approach.

Technology and equitable access

Jill Murphy (University of British Colombia)

- Consider equity in digital health research.
- Engage diverse stakeholders, including service users.
- Consider all aspects of accessibility
- Ongoing challenge is bias of digital data collection.

Enhanced Measurement Based Care Effectiveness for Depression (EMBED)

Raymond Lam (University of British Colombia)

- Involve collaborators into the technology development from the start.
- It may be easier to develop a new program instead of adapting an existing one.

WHO-PEN @ Scale project

Maike Greve (Georg-August-Universität)

- Develop a prototype and obtain review by local experts, such as Ministry of Health staff.
- Ensure the interface is appropriate for service users, such as gaining input from community health workers on which icons to use for a largely illiterate population.
- Review the app in a large field test before rolling out nationwide.
- Integrate individualised risk analysis using data inputted by service user, triggering a suggested action.

Rules of the game

We asked our experts to provide an overview of the technical considerations involved in establishing digital health interventions in low- and middle-income countries.

D Praveen (The George Institute for Global Health) is a contributing author to the WHO's Be Healthy Be Mobile guidance on implementing mHypertension programmes. He drew from this guidance, as well as his experience implementing the GACD-supported SMART Health application, in outlining considerations about selecting the necessary infrastructure for new digital health initiatives.

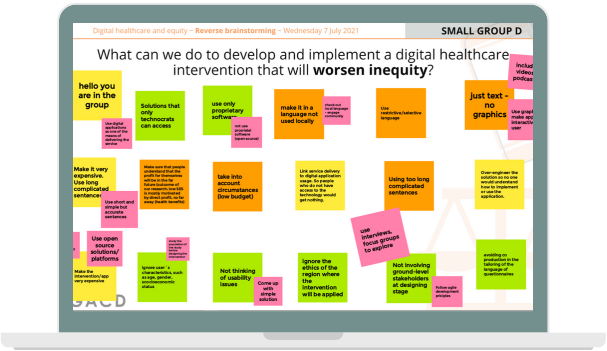
He advises research teams to consider: the type(s) of digital health technology to be used (e.g., SMS, apps, voice, etc.); the available technology options in the context where the research will occur; the process for procurement and adaption of the selected technology; the process of dashboard development to monitor project process and outcomes; procurement of a short code; pricing (which will include negotiation with telecoms regulators, aggregators and operators); data security; and technology piloting and scale-up plans.

Marieke Hoevenaar-Blom (University of Amsterdam) discussed the legal challenges of implementing the PRODEMOS digital health project. Marieke's data analysis team are located in Europe, while the app that they have designed is being used in China. The team was unaware of Chinese law that required that the data from Chinese participants be hosted in mainland China by a Chinese company, and of the fact that EU law complicates international data sharing. These challenges have been overcome - a Chinese company was ultimately selected to rebuild and host the app and data platform in China, and anonymised data was shared with the research team in compliance with both Chinese and EU law. However, in order to avoid such complications, which cost precious time and resources, Marieke recommends that all researchers have a plan for hosting and data sharing before their project is initiated.

Digital interventions and health equity

In breakout groups, we explored challenges and opportunities for health equity through digital health interventions.

Instead of asking each group to brainstorm ideas that would work, we capitalised on our tendency to criticise and see gaps in a plan: we used 'reverse brainstorming' to explore all the ways a digital health intervention could *worsen* inequity.



The most common suggestions to *worsen* health equity through digital health interventions were:

- Develop a business model that targets privileged populations.
- Do not involve users or providers in development of the intervention.
- Only collaborate with high-end, private hospitals.
- Make assumptions about care providers and workplaces.
- Do not make the intervention culturally acceptable or sensitive.
- Assume everyone from one culture or population is the same.
- Use long, complicated, or poorly constructed sentences
- Just text, with no images, icons, or graphics
- Only use English, with no consideration of local languages
- Create a disruptive and time-demanding intervention
- Do not test user experience or exclude some groups from user testing.
- Rely on the newest technology and expensive devices.
- Ensure the intervention requires heavy bandwidth, consistent access to WiFi, and uses up all of the user's data plan.
- Require download of multiple files (PDFs, etc).

Our thanks go to our fantastic facilitators: Morven Roberts, Alyssa Chase-Vilchez, Raymond Lam, Jill Murphy, Sridhar Vaitheswaran, Alison Simmons, Dawn Duke, and Irene Coker.

Expert advice

We were thrilled to be joined by an esteemed expert panel who discussed the sustainability and continued equitable uptake of digital health interventions after the grant life cycle.

Sameer Pujari Head of the Unit a.i. BHM, Strategy and Governance Department of Digital Health and Innovation, World Health Organization

Smisha Agarwal Research Director, Johns Hopkins Global mHealth Initiative, Johns Hopkins Bloomberg School of Public Health

Rick Glazier Scientific Director, Institute of Health Services and Policy Research, Canadian Institutes of Health Research; Senior Scientist, ICES

Maike Greve Head of Digital Health Research Group, Georg-August-Universität

With superb moderation by **Raymond Lam** (University of British Colombia).

We recommend viewing the workshop recording to hear the discussions.

Recommended reading

Agarwal S et al. (2016) Guidelines for reporting of health interventions using mobile phones: Mobile health (mHealth) Evidence reporting and assessment (mERA) checklist. BMJ;352:1–10. doi: https://doi.org/10.1136/bmj.i1174

Araya R et al. (2021) Effect of a Digital Intervention on Depressive Symptoms in Patients With Comorbid Hypertension or Diabetes in Brazil and Peru: Two Randomized Clinical Trials. JAMA;325(18):1852–1862. doi:10.1001/jama.2021.4348

Crawford A and Serhal E (2020) Digital health equity and COVID-19: The innovation curve cannot reinforce the social gradient of health. J Med Internet Res 22(6):e19361. doi: pubmed.ncbi.nlm.nih.gov/ 32452816/

Greve M et al. (2021) Overcoming the barriers of mobile health that hamper sustainability in low-resource environments. J Public Health (Berl.). https://doi.org/10.1007/s10389-021-01536-8

Ha Hong et al. (2021) Implementing Measurement-Based Care for Depression: Practical Solutions for Psychiatrists and Primary Care Physicians. Neuropsychiatric Disease and Treatment: 17 79-90. doi: https://doi.org/10.2147/NDT.S283731

Labrique A et al. (2020) WHO Digital Health Guidelines: a milestone for global health. npj Digit. Med. 3, 120. doi: doi.org/10.1038/s41746-020-00330-2

Morrison J et al. (2021) Learning from a diabetes mHealth intervention in rural Bangladesh: what worked, what did not and what next? Global Public Health doi: 10.1080/17441692.2021.1923776

Murphy, et al. Needs, gaps and opportunities for standard and e-mental health care among at-risk populations in the Asia Pacific in the context of COVID-19: a rapid scoping review. Int J Equity Health 20, 161 (2021). https://doi.org/10.1186/s12939-021-01484-5

van Olmen J et al. (2020) Implementation barriers for mHealth for non-communicable diseases management in low and middle income countries: a scoping review and field-based views from implementers. Wellcome Open Res. 16;5:7. pubmed.ncbi.nlm.nih.gov/32399497/

World Health Organization (2020) Be Healthy, Be Mobile: A handbook on how to implement mHypertension. Available from: www.who.int/publications/i/item/be-healthy-be-mobile-a-handbook-on-how-to-implement-mhypertension

World Health Organization (2019) WHO guideline Recommendations on digital interventions for health system strengthening. Available from: www.who.int/reproductivehealth/publications/digital-interventions-health-system-strengthening/en/

World Health Organization (2018) Classification of digital health interventions. Geneva: WHO/RHR/18.06. Licence: CC BY-NC-SA 3.0 IGO.

About the Global Alliance for Chronic Diseases

Who we are

The Global Alliance for Chronic Diseases (GACD) is the first collaboration of major research funding agencies to specifically address chronic, non-communicable diseases. Together, the members of the alliance represent 80% of global public funding for health research.

Our focus

Implementation science ~ Non-communicable diseases ~ Low- and middle-income countries and vulnerable populations in high-income countries

> "Implementation science examines what works, for whom and under what circumstances, and how interventions can be adapted and scaled up in ways that are accessible and equitable."
> ~ GACD Strategy Board

Our mission

To reduce the burden of chronic non communicable diseases (NCDs) in low-and middle-income countries, and in indigenous populations facing conditions of vulnerability in high-income countries, by building evidence to inform national and international NCD policies and contribute to the achievement of the Sustainable Development Goals.

Our strategic objectives

- Investing in impactful implementation science research.
- Building implementation science capacity and capability in relation to NCDs.
- Facilitating collaborations and partnerships to support GACD impact.

Connect with us

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This workshop summary was prepared by the GACD secretariat. Content is based on the work of our brilliant GACD Research Network members and invited guest speakers, with our thanks.