



GUEST EDITORIAL

Can digital tools improve clinical care in psychiatry?

Inez Myin-Germeys 

KU Leuven, Department of Neuroscience, Research Group Psychiatry, Center for Contextual Psychiatry, Leuven, Belgium

Mobile health technology is on the rise as an avenue for new interventions in psychiatry (1), and it is claimed to be the primary road to personalized mental health care (2). The use of apps and wearable devices to track people in their day-to-day life seems to provide endless opportunities for better assessment and optimized person-centered interventions. Most patients with mental health problems possess mobile phones (3) and up to 80% of them are seeking to use apps for tracking or treating their mental health problems (4). However, the question is how we can make optimal use of these resources to fundamentally improve psychiatric care.

Mobile sensing, using smartphone and wearable sensors to create a digital phenotype of mental health problems, has been proposed as a radical innovation in the assessment and prediction of mental health problems (5). However, it strengthens the old adage of the patient being a passive recipient of care, being told by either their clinician or by the machine learning algorithm what is wrong and what they need to do about it. A more radical shift would be to use digital technology to make patients much more active partners in their treatment process. Patients are the key experts of their own experiences. Yet, they lack the tools to bring this expertise to the table. This is where mobile technology can step in. A digital structured diary technique, such as the Experience Sampling Method, requires patients to actively collect data about their own experiences, thoughts, symptoms, and the context thereof in the flow of daily life (6,7). It allows capturing how mood and symptoms fluctuate from moment to moment but also how these temporal dynamics are associated with contextual factors such as the company someone is in or the activity someone is doing. When the app is paired with a dashboard, the clinician

together with the patient can visualize the data to develop a joined understanding of the current situation and potential treatment targets. Using digital technology in this way makes the patient an active and central participant in their own treatment. It gives the person a tool to better understand their own patterns of behavior and how these can be changed. But it also creates the possibility for the clinician and patient to develop a shared understanding of what is relevant for this patient specifically, thus contributing to more shared decision-making and better targeting of treatment to the needs of each individual, that is, more personalized psychiatry. In the European project IMMERSE (<https://www.immerse-project.eu/>), we are running an implementation trial to investigate not only the efficacy of such an approach but also how it could be implemented in routine mental health care.

Next to using digital technology for creating a shared understanding of problems, it has also been used for extending psychological interventions from the therapy room into daily life. Ecological Momentary Interventions typically use an app to deliver treatment in the real world and real time (8). They have mainly been used to transfer existing therapies to daily life (1) although they could also be used to develop entirely new interventions (9). They can be deployed as a stand-alone treatment, but they seem to be most efficient when used as a blended care intervention, combining face-to-face therapy with an app (8). We developed such a blended care intervention called Acceptance and Commitment Therapy in Daily Life (ACT-DL). ACT-DL combines 8 sessions of face-to-face Acceptance and Commitment Therapy with 3 days of using the ACT-DL app after each session. With the app, people are practicing what they have learned in therapy in the flow

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Correspondence: Inez Myin-Germeys, Center for Contextual Psychiatry, KU Leuven, O&N 5b, Herestraat 49, box 1029, Leuven, 3000 Belgium

E-mail: inez.germeys@kuleuven.be

of daily life, thus bridging the gap between the therapy room and day-to-day life (10). We developed the app to augment the effects of the therapy in patients in the early phases of psychosis (11). In a randomized controlled trial, we found that ACT-DL was outperforming treatment-as-usual (including CBT) in improving negative symptoms and social functioning, two of the hardest-to-treat symptoms (12). Furthermore, we found that the intervention was feasible and accessible although it could further be optimized for use in this patient group (13).

The newest development in digital psychological interventions is Just-In-Time-Adaptive Interventions (JITAs) (14). Similar to EMIs, JITAs deliver treatment in real life; however, they do so specifically at moments when individuals are most at risk. Although JITAs seem promising for the advancement of personalized psychiatry, the actual development of JITAs is still in its infancy (15,16). Offering treatment when it is most needed requires a sound knowledge of the dynamics of mental health problems, and of the underlying psychological and physiological processes that can be measured in real time, to define when to intervene and how to intervene.

To conclude, digital interventions definitely have the potential to improve mental health care. However, we still need more research. First, more evidence is needed on the efficacy and efficiency of new EMIs and JITAs (1). We also should deepen our understanding of the dynamics of real-life mental health processes to intervene optimally. Second, when new digital interventions have been developed and tested, we have to focus on implementing them in routine mental health care. This is extremely relevant as a majority of new developments to date do not make it to the clinical market (1). We need more implementation research outlining how these digital technologies can be integrated into mental health care. And finally, these technological innovations should happen in close collaboration with the relevant stakeholders, such as people with lived experience and clinicians. We need to develop a technology-enabled clinical service rather than new technology per se (17). Digital technology could play an important role in innovating psychiatric care if we use our resources wisely.

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AUTHOR BIOGRAPHY

Inez Myin-Germeys is a psychologist and professor of Contextual Psychiatry at KU Leuven, Belgium. She is the head of the Center for Contextual Psychiatry (CCP), which she founded in 2015 at KU Leuven in Belgium. Before that, she worked at Maastricht University in the Netherlands. Prof. Inez Myin-Germeys is a world-renowned expert in the field of Experience Sampling Methodology and mobile Health (mHealth), in relation

to psychopathology, and more specifically psychosis. The CCP is focusing on the study of stress-sensitivity and altered social interactions in the development of psychopathology, on the clinical implementation of ESM as a tool for self-management and shared decision making, on the development of new Ecological Momentary Interventions, and on research from a first-person perspective. Inez Myin-Germeys is an ERC consolidator grantee, has published over 450 papers and has supervised over 40 PhD projects.