Schizophrenia and Smartphones: Separating Speculation From Science

November 30, 2015 | Schizophrenia [1], Telepsychiatry [2]
By John Torous, MD [3] and Joseph Firth, BSc [4]

Can mobile technologies advance care for schizophrenia? The research literature strongly supports feasibility, although clinical data on validity, safety, and efficacy are still lacking.

BRIEF COMMUNICATION

Schizophrenia is a severe mental illness characterized by symptoms that may include delusions, hallucinations, and disorganized thoughts or speech. The global disability, suffering, and economic impact of schizophrenia highlights the need for innovations in the diagnosis, monitoring, and treatment of this disease. Is there a role for smartphones and mobile technology to advance the care of patients with schizophrenia?

With the rapid expansion of mobile health (mHealth) technologies, there has been an increased interest in the potential of smartphone health apps for schizophrenia. It is easy to imagine how smartphones could enable patients to record their symptoms in real time using brief, pop-up surveys (active data). Additionally, these phones could collect passive data about their activity patterns (from GPS sensors), social connectedness (from anonymized call and text logs), and voice tone (from microphones).

From this data, algorithms could be developed for analysis, in order to potentially predict relapse and even discover patterns of psychological well-being, which psychiatrists and patients could review together. Perhaps in the future, smartphones could also serve as powerful adjuvants that help patients with medication adherence, physical activity, and even digital therapies in supporting their clinical care.

Without clinical data and scientific studies, however, such models of the future will remain just that—models. Smartphone apps for schizophrenia must be supported by a strong research base that informs discussions on validity of mobile data, efficacy of intervention, risks, benefits, and adverse effects.

App-based interventions may at first appear to present zero risk—but what if app use occupies so much time and attention that patients spend more time in front of a screen than outside and active? Or what if any app offers incorrect medical advice? Furthermore, just because we can collect so much information from smartphones does not inherently mean that it is clinically useful. For example, an electroencephalogram (EEG) can collect millions of data points about neural activity and brain waves, although this is not routinely used in health care services, because the implications for treatment from these observations are limited. Finally, will these patients even want to use...
A summary of data

To begin to answer these questions, we conducted a systematic review of the published literature on the role of smartphones for schizophrenia. We included those papers with quantifiable outcome data. We identified only 7 studies to date, with most studies being pilot in nature. These 7 studies provide an interesting window into the potential for smartphones in schizophrenia, and the path for future research.

Despite often voiced concerns that patients with schizophrenia may reject smartphone interventions or that using technology may increase their paranoia, we found no evidence of serious adverse effects of smartphone use in any of the studies. No patients decompensated or became more disorganized, delusional, or paranoid because of smartphone use. Rather, patient response was overall positive and they found using a smartphone to be easy and often helpful.

Another common concern is that the disorganization and cognitive symptoms associated with schizophrenia may prevent patients from being able to engage with smartphone apps; or they may forget to use them at all. Across all 7 studies, the overall retention rate was 92% and patients were adherent to smartphone apps use on average 85% of the time. Patient engagement and adherence to smartphone apps in schizophrenia is comparable to other illnesses such as heart disease or diabetes.

Due to the pilot nature of the 7 studies in our review, there were very few statistics on efficacy. However, the diversity of smartphone apps was impressive. Some apps targeted symptom monitoring, while others focused on treatment goals. Each approach showed feasibility and acceptability data, supporting the potential of mHealth in schizophrenia from both a monitoring and intervention role. However, no studies focused on passive data collection or explored the acceptability of such methods.

The bottom line

While the potential benefits of using smartphone technology to enhance care in schizophrenia appears vast, the current evidence base is modest. However, our review shows that patients are interested, willing, and able to use smartphone apps both to assess and monitor their symptoms, and to engage with self-management strategies. That said, there is a clear need for more studies, especially those that focus on passive data, and those that move beyond pilot acceptability and feasibility to include randomized control groups. As the evidence base continues to grow, the role of smartphones as a powerful clinical adjunctive tool (or instead just another novelty) will become apparent.

Disclosures:
Dr Torous is a Clinical Fellow in Psychiatry at Harvard Medical School and Senior Resident at the Harvard Longwood Psychiatry Residency Training Program in Boston. Mr Firth completed his first degree in Psychology at The University of Sheffield, UK. He has begun PhD in Medicine at the Institute of Brain, Behaviour and Mental Health, University of Manchester. His research focuses on developing and evaluating novel interventions to facilitate symptomatic and functional recovery in young adults with mental disorders. The authors report no conflicts of interest concerning the subject matter of this article.

References: