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ScienceTalk

Electric dreams - the future of mental healthcare is digital

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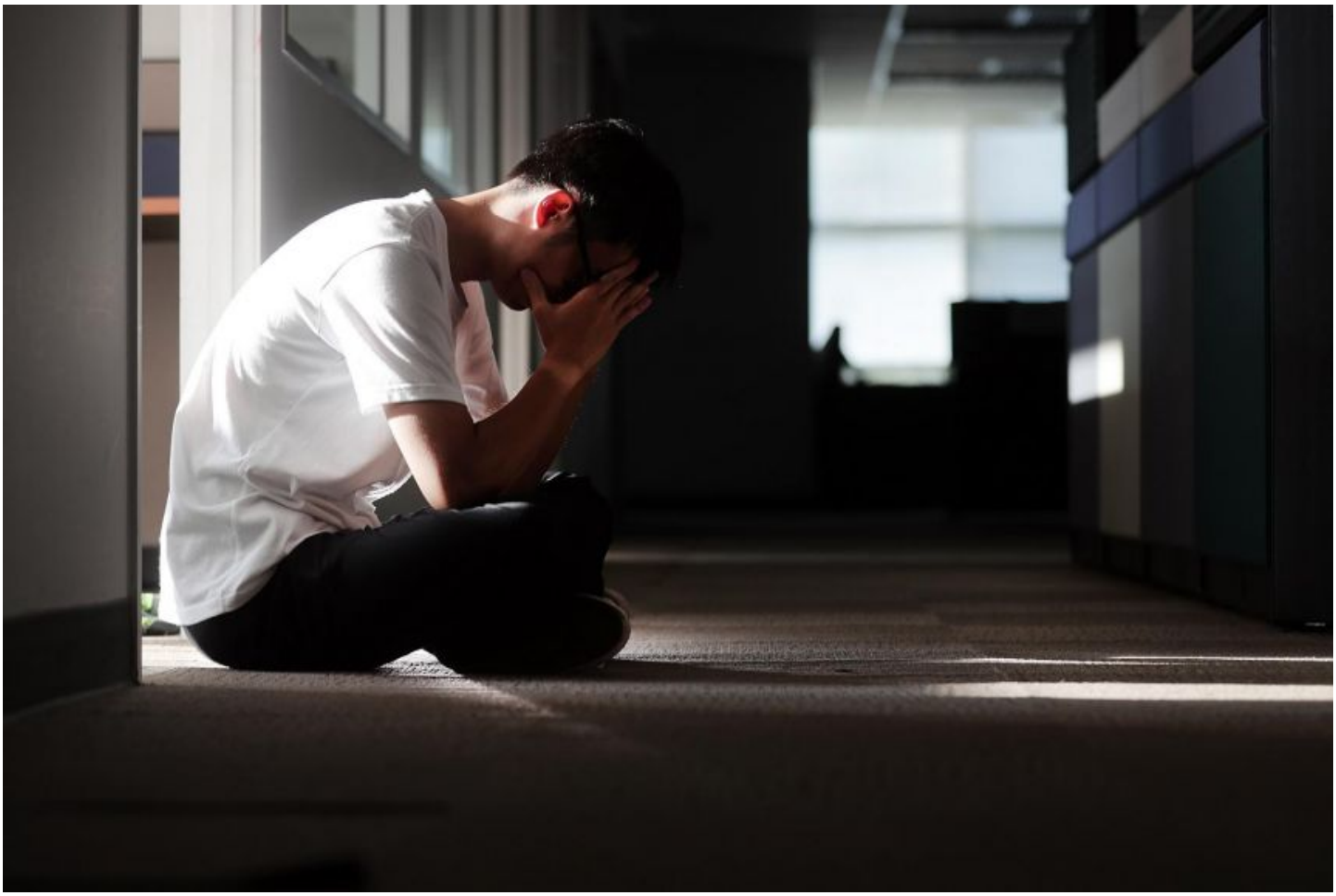

Understanding the mental health of patients remotely - especially those with severe illness, enables better patient-centred care. PHOTO: ST FILE

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Mental health is the defining problem of our generation.

It has all the elements of a complex social-scientific problem. While pervasive, mental disorders are grossly under-diagnosed. There is lack of awareness of the issue, and sufferers face stigma, little engagement and a variable quality of care.

In the 2019 Global Burden of Disease study, mental disorders were the second leading contributor to years lived with disability. Studies by the Institute of Mental Health (IMH) further show that the lifetime prevalence of mental disorders in Singapore has increased from 12 per cent in 2010 to 13.9 per cent in 2016.

What is of concern is that more than three-quarters of those with a mental disorder in their lifetime did not seek professional help.

Covid-19 has put the spotlight on mental health.

There is not only anxiety about the virus, but the accompanying economic and societal consequences. As we begin to address the ensuing mental health tsunami, we envisage a long-term process with no easy solutions.

Reimagining mental healthcare

Mental disorders affect an individual's cognition, emotion and behaviour.

Often, a change in behaviour is the presenting symptom.

Unlike a typical medical consult, where a physical examination or blood test might reveal the diagnosis, mental health assessment relies on verbal cues from the patient and other sources. At times, such information might be incomplete or even contradictory.

There is much need for objective data to guide diagnosis and treatment.

Smart devices are the hallmark of the 21st century. With the increasing digitalisation of our lives, there are opportunities to tap into existing data sources to provide clinical insights into our health status.

Such digital biomarkers provide objective physiological and behavioural data obtained from sensors that we wear or carry.

Beyond physical activity and heart rate, data on geolocation, sleep, sociability from messaging, phone calls and social media are readily available.

Paired with advanced analytics, a digital phenotype or profile can be put together, which allows the individual to be more informed about his or her own health status.

Understanding the mental health of patients remotely - especially those with severe illness, enables better patient-centred care. This disrupts the current health delivery model, with a shift from traditional in-person clinic visits to continuous health status monitoring.

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How technology can make a difference

Re-thinking ways to treat mental disorders call for new approaches to generate insights and evidence to drive decision-making.

Patients can input their health status via sensors or self-reported outcomes; clinicians can enter test results and treatment plans; and digital platforms can monitor adherence to treatment and track progress over time.

There is a need for timely and proactive engagement of the patient, to empower greater involvement in his or her own health. Whether it is through serious games (or gamification), emotionally intelligent chatbots or algorithm-initiated medical consults, the need for informative and interactive solutions is pronounced.

Companies such as digital health and data science firm Holmusk have developed hybrid-AI platforms to support decision-making in mental health. This collates, organises and analyses real-world data in behavioural health and psychiatry, and develops predictive models to enable better patient care.

Treating mental disorders has also gone online.

Internet-based behavioural therapy and tele-therapy sessions with mental health professionals are initial forays which have taken greater prominence following Covid-19.

Digital phenotyping, coupled with digital therapeutics, promises powerful new tools for the doctor's repertoire.

It engages the patient, provides real-time feedback, and facilitates meaningful discussions with the healthcare team around treatment goals and plans.

A milestone was reached in 2017, when the United States Food and Drug Administration (FDA) approved "reSET", a prescription digital therapeutic for substance use disorder.

Developed by Pear Therapeutics, this app is prescribed in place of a pill or injection, to deliver clinically-validated interventions.

While "reSET" was the first approved digital therapeutic, there are many others in the pipeline for insomnia, migraine, schizophrenia and other conditions.

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Digital platforms permit rapid scaling to large groups of users. This has become invaluable in the pandemic, where entire populations encounter extraordinary stressors at the same time.

These platforms deliver health information, resources and interventions to anyone with Internet access and enable early identification of those who require professional help.

In June 2020, mindline.sg was launched to provide self-assessment tools and a compendium of resources for emotional well-being. This was enhanced in October to include "Wysa", an emotionally intelligent AI chatbot to help users manage stress and emotions through evidenced-based self-help techniques.

Even as we take first steps, there will already be transformation of healthcare delivery from the clinic to online consultation and care. However, the real transformation will come when we enhance the level of engagement and the effectiveness of care itself.

Real-world challenges to virtual roll-out

While the technologies to disrupt mental healthcare are already available, taking them into the clinic may not be so simple. There is a need for clinicians to work closely with patients, engineers, social workers and public health agencies to test, validate and field new ways to manage mental health in the community.

For a start, we need to determine what is medical information that is stored and accessible in electronic health records, and what is private that goes beyond a doctor-patient relationship.

As we collect pervasive data about an individual's activities, behavioural choices and sleep patterns, we need to balance actionable medical information and patient privacy.

Health authorities have been grappling with how to regulate digital products, whether these are for monitoring disease or providing therapeutic interventions. Singapore's Health Sciences Authority (HSA) approved its first digital therapeutic as recently as June 2020, the first regulatory agency to do so outside the US.

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The challenge remains to develop regulatory pathways to approve such products, without forgoing the rigorous clinical efficacy and safety trials required for all other classes of medical products.

Digital therapeutics need to be integrated within existing health systems. This requires not only approved software and hardware, but evidence-based clinical practice guidelines.

Physicians will need to be educated on how to prescribe digital apps, how to monitor compliance, and how to assess clinical outcomes.

Finally, we need to review how prescription and treatment costs can be reimbursed, including whether these are covered by medical insurance and other payment schemes.

Incentives can also be in-built to enhance patient acceptance and adherence to therapy.

The future of mental healthcare is digital.

Developments will change how clinicians diagnose, monitor and manage mental disorders, taking treatment from the clinic into each patient's mobile device.

This goes beyond developing software.

There is a concurrent need to address pertinent issues relating to patient confidentiality, safeguards for data privacy, treatment models, regulatory pathways, reimbursement of costs, as well as patient and physician adoption.

Reimagining mental healthcare is the easy part, making it happen will take time. We have to do better than the current state of mental healthcare - that is our goal.

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About the writers

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