

Mental health in the age of AI

Digital tools can help amid manpower shortage at public health institutions



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It is generally a two-month wait to see a psychiatrist at the Institute of Mental Health (IMH) outpatient clinic.

So, to help patients through the dry spell between sessions, the hospital is studying if it can use a locally developed AI-powered app that, among other things, provides guided meditation and is able to predict the user's stress level.

Since May 2025, IMH has offered the AmDTx app, or a placebo app, to individuals referred by a GP or a polyclinic doctor to the institute, to participate in the trial.

"Coping skills such as deep breathing and sleep hygiene can help one manage stress, or even symptoms of anxiety and depression. They can learn these from the app and start the interventions first. This will hopefully reduce their distress while waiting to see the specialist," said Dr Christopher Cheok, a senior consultant at IMH and director of national mindline 1771, Singapore's first helpline and text service for mental health.

Dr Cheok said the long wait times in public mental healthcare are because of rising demand and limited manpower.

IMH is also exploring the use of



other apps to monitor and support the care of mental health conditions, including one approved by the US Food and Drug Administration (FDA).

In general, digital tools include AI-enabled chatbots, mobile apps, wearable devices, and web-based programmes. Apps may be able to assist in cognitive behavioural therapy, detect depression risk in the user's voice, and more, experts here say.

Some of these tools can be seen at an exhibition on digital mental



health, organised by the Yeo Boon Khim Mind Science Centre and D.S. Lee Foundation Mind Art Experiential Lab (MAELab), which opened at the MAELab space in

Alexandra Hospital on July 11.

While the centre said it does not endorse any of the tools, they demonstrate the potential of digital and AI-powered technology.

TECH CAN HELP

An app that is available from a healthcare provider, Rejoyn was the first prescription digital therapeutic for the treatment of major depressive disorder to be approved by the FDA, in 2024. The smartphone app, designed to be used

alongside medication, delivers a programme of evidence-based brain-training exercises and therapeutic lessons to help adult patients manage their symptoms.

Other tools shown at Maelab include an online assessment tool from local firm Neurowyzz, which screens for early cognitive changes, and a Voice AI tool from another Singapore-based firm, Wonder Technologies, that screens for depression risk.

The latter will soon undergo testing over a year with participants

recruited from institutions affiliated with the National University of Singapore and National University Health System, said the firm's CEO, Ms Wendy Wu.

A similar Voice AI tool to detect early signs of depression in older adults is being developed here under SoundKeepers, a three-year local programme announced in October 2024. Its researchers said that developing a native technology for Singapore facilitates compliance with national healthcare data protection standards.

It was at the height of the Covid-19 pandemic in June 2020 that the MOH Office for Healthcare Transformation (MOHT) created mindline.sg as a digital mental health resource website, which now boasts an AI-enabled chatbot Wysa.

Ms Janice Weng, deputy director of mindline.sg at MOHT, said digital solutions are useful for mental health self-help, and the office would like to pilot a form of self-directed psychotherapy that is being used at IMH in community and primary care settings.

iCBT (internet-based Cognitive Behavioural Therapy) could enhance access to affordable mental health care in the community and help reduce unnecessary visits to the hospitals, she said.

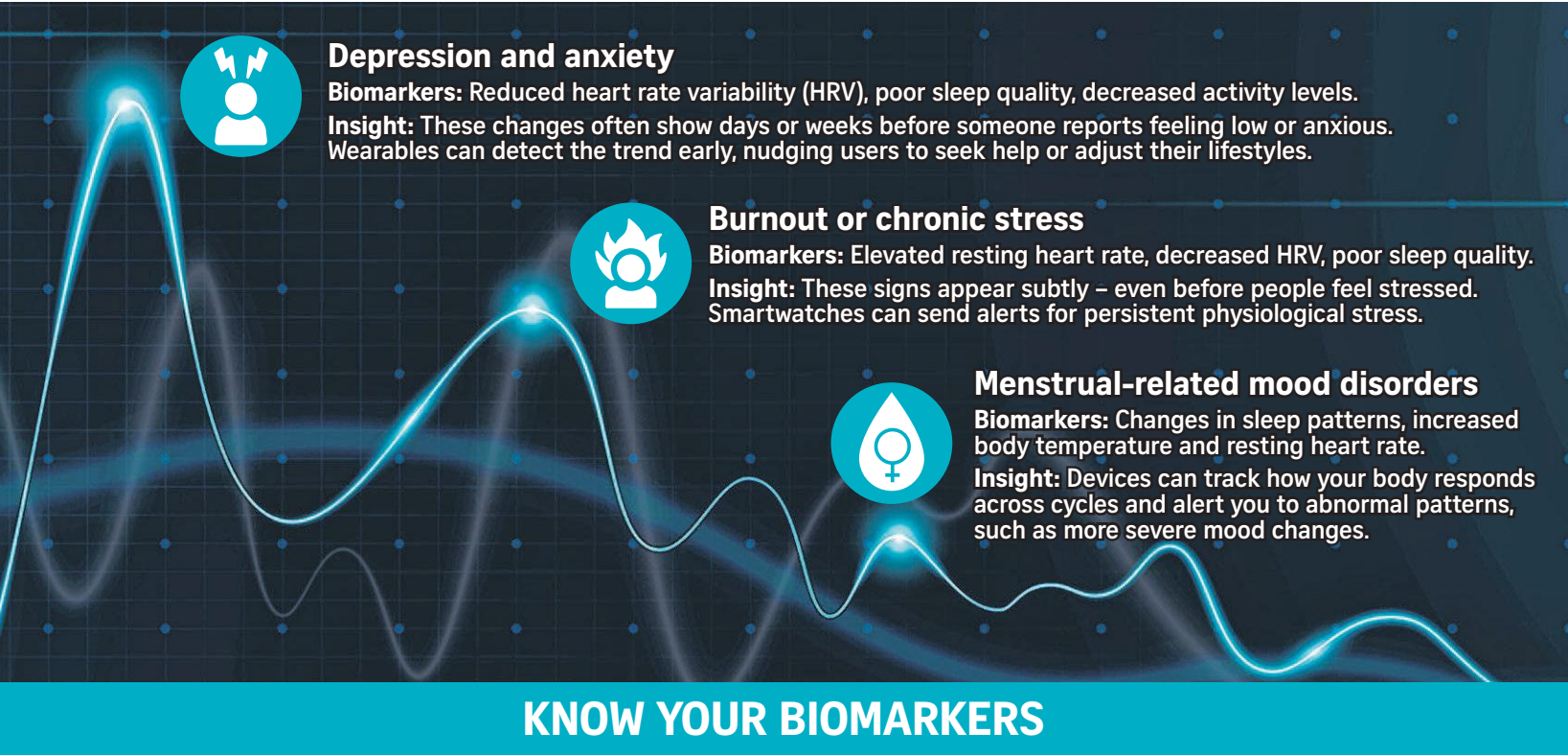
MOHT is starting to develop AI models analysing Singlish, multilingual texts, and emotional cues and nuances that Western tools may miss, she added.

Another digital health platform that it co-developed with IMH uses data from fitness trackers and smartphones to help care teams tailor support and empower individuals with psychosis and mood disorders to manage their own mental health. It may be useful for predicting depression in youth.

Digital phenotyping, which uses smartphone data to understand user behaviour, is emerging as a

Tracking tiny shifts in our bodies that hint at mental strain

An exhibition on digital mental health tools highlights some biomarker changes that precede mental health issues. It was launched by the Yeo Boon Khim Mind Science Centre at its MAELab space in Alexandra Hospital.



Heart rate variability

- HRV – the variation in time between each heartbeat – can indicate overall stress burden and recovery status. Reduced HRV has been observed in anxiety disorders, depression, and more.
- HRV is highly individual, as it is influenced by factors such as genetics, age, sex, and more, so comparing it across individuals is often unhelpful. Longitudinal tracking of one's own HRV baseline offers more meaningful insights.
- While a higher HRV is generally considered better, there is no universal cut-off for what constitutes "low HRV". A sustained drop of 20%-30% below an individual's norm over weeks or months may be more indicative of concern than a one-off low reading.

Respiratory rate

- The number of breaths you take every minute reflects how your body is functioning, especially during rest or sleep.
- Changes in your respiratory rate – especially when you are asleep – can be early signs of not just issues such as infections, but also of stress or anxiety. It can also be due to overtraining or hormonal fluctuations.

Body temperature

- Wearables can measure peripheral skin or wrist temperature (not core temperature).
- A rise in temperature from your baseline level can signal the early stages of infection or illness while a subtle rise can indicate ovulation due to hormonal changes. Look for repeated or sustained increases from your usual pattern.
- Also, a small elevation of 0.2 deg C to 0.5 deg C, for example, may not point to illness. But when combined with other symptoms, it might suggest your body is under stress.

Sleep metrics

- Sleep, including its various stages, can be tracked by analysing metrics such as HRV, body temperature and more.
- They help to detect sleep patterns linked not just to physical issues – such as reduced deep sleep after overtraining – but also mental health issues, such as insomnia in depression or fragmented sleep in anxiety.
- A lack of sleep is associated with irritability, anxiety, and a higher risk of depression. Deep sleep regulates stress hormones while REM (rapid eye movement) sleep supports emotional processing.

Activity metrics

- These include steps taken, calories burned, distance travelled and activity intensity.
- Physical activity triggers endorphins, dopamine, serotonin, and norepinephrine, which are key regulators of mood, motivation, and stress resilience.
- Regular activity is linked to reduced stress, improved mood, better sleep, and lower rates of depression and anxiety. Tracking one's activity metrics can reinforce these positive behaviours.

Source: YEO BOON KHIM MIND SCIENCE CENTRE PHOTO: ADOBE STOCK STRAITS TIMES GRAPHICS

promising way to detect mental health issues. Researchers have found, for example, that shifts in heart rate variability or sleep patterns can signal anxiety or low mood before individuals are even aware of it.

Dr Jill Murphy, the executive director of the APEC Digital Hub for Mental Health who was in Singa-

pore recently, said she is particularly excited about how this technology could lead to more personalised care. "Although more research is needed in this area, it has the potential to shift the focus from broad categories of mental illness like depression to a more patient-centred approach," she said.

Tailoring interventions and treat-

ment plans to match a person's unique needs, values, culture and experiences could also increase engagement with digital tools, she added. Dr Murphy was a plenary speaker at the Singapore Mental Health Conference held from July 16-17, addressing how to use digital technologies to promote equitable access to mental health promotion

and care in the Apec region.

TREADING WITH CAUTION

A big problem with digital mental health tools, however, is the sheer number of options out there, the majority of which have not been proven to be effective.

Adjunct Associate Professor Cor-

MENTAL WELL-BEING

- National helpline: 1771 (24 hours) / 6669-1771 (via WhatsApp)
- Samaritans of Singapore: 1-767 (24 hours) / 9151-1767 (24 hours CareText via WhatsApp)
- Singapore Association for Mental Health: 1800-283-7019
- Silver Ribbon Singapore: 6386-1928
- Chat, Centre of Excellence for Youth Mental Health: 6493-6500/1
- Women's Helpline (Aware): 1800-777-5555 (weekdays, 10am to 6pm)
- The Seniors Helpline: 1800-555-5555 (weekdays, 9am to 5pm)

COUNSELLING

- TOUCHline (Counselling): 1800-377-2252
- TOUCH Care Line (for caregivers): 6804-6555
- Counselling and Care Centre: 6536-6366
- We Care Community Services: 3165-8017
- Shan You Counselling Centre: 6741-9293
- Clarity Singapore: 6757-7990

ONLINE RESOURCES

- mindline.sg/fsmh
- eC2.sg
- tinklefriend.sg
- chat.mentalhealth.sg
- carey.carecorner.org.sg (for those aged 13 to 25)
- limitless.sg/talk (for those aged 12 to 25)

nelia Chee, head and senior consultant at National University Hospital's psychological medicine department, said plenty of work remains to establish the effectiveness, safety, and ethical use of digital and AI-enabled tools in real-world clinical settings.

She cautioned that these tools should complement, and not replace, the therapeutic relationship that remains central to mental healthcare.

The Organisation for the Review of Care and Health Apps (Orcha), founded by clinicians from Britain's National Health Service, reviewed approximately 35,000 uses of digital health technology, and found just 20 per cent to be secure, cyber-safe, and clinically effective.

Dr Cheok said a search shows that there are more than 10,000 mental health apps on the Apple App Store and Google Play store.

"In general, I think because apps are not regulated, no one can vouch for the quality of the information contained in the app or the intervention that's within the app, and one thing the public may not be so aware of is how their data is being used," he said.

"Therefore, whichever apps we choose to evaluate, they must have shown to be useful in other countries and have been subjected to research studies for efficacy and validation."

Dr Cheok said IMH picked the AmDTx app as it was shown to work overseas, and is now studying its effectiveness in the local population. The other test site for the trial, expected to end by the first quarter of 2026, is the Singapore

General Hospital.

For now, Dr Murphy advises checking app privacy policies, published scientific studies, and endorsements from reputable organisations when evaluating digital mental health tools.

She said organisations like Orcha have established standards for reviewing apps. Orcha has also created a Mind App Library, where users can browse apps that meet the standards that it has identified, she said.

Associate Professor John Wong, director of the Yeo Boon Khim Mind Science Centre, said that with more apps coming to market, individuals must learn to make informed choices.

"What you really want is not to tell people what to buy, what to use, but what is in the technology, what is it that you need? And then they can be informed users," he said.

IMH chief executive officer Daniel Fung said validated digital tools for the population will likely be accessible through mindline.sg in the future.

MOHT's Ms Weng said programmes such as mindline.sg, iCBT, and peer-led platforms could in the future make mental healthcare widely and easily accessible.

"Singapore can pioneer a hybrid model – where AI handles scale and prevention, and limited manpower focuses on where the needs are best met with empathy and complex care," she said.

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