Scientists in SG develop computer program that can detect those at higher risk of depression

By **CLARA CHONG**

Professor Josip Car (left), who led the study, and Lee Kong Chian School of Medicine senior research fellow Iva Bojic. — Nanyang Technological University/ST/ANN

SINGAPORE: Scientists from Nanyang Technological University, Singapore (NTU) have developed a computer program that can detect individuals who are at a higher risk of developing depress

The predictive program analyses a person's physical activity, sleep patterns and circadian rhythms

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A trial of 290 adults carried out in 2019 over three months showed that the program has an accuracy of 80% in detecting those with depression (or at a high risk of developing depressive symptoms/depression) as compared with healthy individuals.

Trial participants were adults between 21 and 69 years old and wore a tracking device for two weeks. The average age was 33 years.

Professor Josip Car, the director of the Centre for Population Health Sciences at the Lee Kong Chian School of Medicine, who led the study, said on Monday (Jan 24) that to fine-tune and improve the machine learning algorithm, the team is planning larger studies of more than 1,000 participants monitored over a course of two years.

Anyone can join the study and there are no selection criteria, Prof Car added.

Depression affects 264 million people globally, and is undiagnosed and untreated in half of all cases, according to the World Health Organisation's website.

The Institute of Mental Health said in August last year that a study of more than 1,000 participants found that 13% reported symptoms of anxiety or depression during the Covid-19 pandemic.

Of NTU's study, Prof Car said: "Our study successfully showed that we could harness data from wearables, and given the increasing popularity of such wearable devices, it could be used for timely and unobtrusive depression screening."

Nearly a billion people wear activity trackers.

The researchers cautioned that their program is not intended to predict the possibility of an individual getting depression, but rather, to detect if a person is at high risk of suffering from depression at present.

The team also found that certain patterns in a person's behaviour can be associated with depressive symptoms, such as feelings of helplessness and hopelessness, loss of interest in daily activities, and changes in appetite or weight.

Those who had more varied heart rates between 2am and 4am, and between 4am and 6 am were prone to show more severe depressive symptoms.

This confirms findings from previous studies, which found that changes in heart rate during sleep may be a valid physiological marker of depression.

Less regular sleeping patterns, such as varying waking times and bedtimes, are also associated with a higher tendency to have depressive symptoms.

Although weekday rhythms are mainly determined by work routines, a person's ability to foll these routines differs between depressed and healthy individuals. Those who are healthy are

"We look forward to expanding on our research to include other vital signs in the detection of depression risk, such as skin temperature. Fine-tuning our program could help in facilitating early, unobtrusive, continuous, and cost-effective detection of depression in the general population," Prof Car said.

Associate Professor Georgios Christopoulos, from NTU's Nanyang Business School, who co-led the study, said: "Our team will also be working on expanding to other types of psychological status, such as mental fatigue. The program could also be personalised in the future."

The results of the study were published in peer-reviewed academic journal *JMIR mHealth and uHealth* in November last year. – The Straits Times (Singapore)/Asia News Network

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