Singapore AI detects early psychosis in youth

The framework developed by NTU and IMH researchers identified up to 93% of at-risk youths by analysing emotional patterns in brief, spontaneous speech samples.

Asia Behavioral health

By Adam Ang | October 20, 2026 | 12:10 AM



Photo: Vitaly Gariev/Pexels

Nanyang Technological University, Singapore, and the Institute of Mental Health have developed an AI framework that analyses casual conversations to identify young people at high risk of developing psychosis.

Unlike conventional AI models that attempt to predict mental health risks directly from speech transcripts, the new framework combines

emotional signals extracted by large language models (LLMs) with traditional machine learning to assess psychosis risk, achieving up to 93% sensitivity in a study involving 400 participants.

HOW IT WORKS

Researchers developed LEMon-AID (Latent Emotion Proxy for Mental Health Detection with AI-integrated Decision-making), a framework that uses LLMs to assess a person's emotional state.

The LLMs extract subtle emotional profiles, including joy, trust, fear and sadness, from transcripts of young individuals' speech and combine these signals with predictions from traditional machine learning models.

LEMon-AID then generates risk assessments and explanations in natural language.

The research, described as the first of its kind in Singapore, received funding from the Ministry of Health through the National Medical Research Council Office.

FINDINGS

The researchers first tested whether LLMs could directly predict psychosis risk from raw speech transcripts.

They analysed transcripts from 429 participants aged 14 to 29 enrolled in the Longitudinal Youth-at-Risk Study, a Singapore study launched in 2008 to examine the social, clinical and biological risk factors associated with ultra-high risk of developing psychosis.

Each participant provided a 45-second speech sample in response to a neutral prompt that did not require them to mention their mental health condition.

The researchers found that standard LLMs struggled to predict psychosis risk from the transcripts, challenging the expectation that LLMs can make accurate predictions based on vignettes and certain social media data.

"These models performed no better than chance," study co-lead investigator Dr Wilson Goh, an assistant professor at NTU's Lee Kong Chian School of Medicine (LKCMedicine), told ***MobiHealth News***.

"When we directly asked standard AI models to identify at-risk individuals from casual conversation transcripts, they missed almost everyone," added first author Matheus Calvin Lokadjaja, a research assistant at LKCMedicine.

The team then developed LEMon-AID, which achieved up to 93% sensitivity in identifying participants at high risk of psychosis.

"This potentially allows for timely clinical assessment, intervention and support to improve long-term outcomes," Lokadjaja told this publication.

Dr Goh highlighted privacy protection as a key strength of the framework's design.

"It does not require the original speech, only the inferred emotional vectors. These emotional vectors can be used to train AI models to recognise patterns associated with early mental health disorders."

However, Lokadjaja cautioned that the framework's overall accuracy of 67% indicated its limitations, including the risk of false positives.

Still, the overall findings suggest that LEMon-AID has "strong potential" as an early screening tool for psychosis, he said.

WHY IT MATTERS

Early identification of people at ultra-high clinical risk of psychosis remains challenging because teenagers "rarely articulate mental health struggles directly," the research team said in a statement.

The team sought to address this challenge by investigating whether AI could identify potential risk from casual, spontaneous conversation.

"[LEMon-AID] connects emotional patterns with mental health risks while keeping patient data private and providing clear, understandable explanations," explained Dr Goh.

According to Lokadjaja, the AI framework could serve as a decision-support tool, helping clinicians triage and prioritise patients and identifying those who may benefit from closer monitoring and earlier follow-up.

The framework could also support organisational decision-making, added Dr Goh. The research team is working with a local platform to explore its use in quality assurance and counsellor performance assessment.

The researchers are now exploring potential clinical applications for LEMon-AID, including multimodal approaches that incorporate acoustic cues like vocal pitch and speech rhythm, as well as facial expressions, to improve reliability.

They also plan to conduct participatory research to understand how users will trust, accept and use the technology.

Additionally, the team will work with implementation scientists on simulated enactments at the NTU Centre for AI in Medicine.

The team stressed that further extensive research and real-world validation are needed before the framework can be deployed in clinical practice.

THE LARGER TREND

Across Asia-Pacific, digital mental health initiatives are taking different approaches to integrating AI into services for young people.

In Australia, a digital mental health platform has been launched to support Australians aged 7 to 17 without relying on AI chatbots.

Meanwhile, youth mental health organisation Orygen and the University of Melbourne secured $9 million in funding last year from Wellcome to incorporate AI-driven personalisation into Orygen's Moderated Online Social Therapy platform, which had been integrated into more than 400 youth mental health services across Australia.

In South Korea, the Ministry of Health and Welfare recently issued national guidelines on the safe use of generative AI for mental health support, including guidance for children, adolescents and their guardians.

Tags: Nanyang Technological University, Singapore, Institute of Mental Health Singapore, LEMon-AID, psychosis, psychosis risk prediction, LLM